



THE SHERWIN-WILLIAMS COMPANY
Environmental, Health & Regulatory Services
101 Prospect Avenue NW
Cleveland, Ohio 44115-1075
Facsimile: (216) 566-2730

July 10, 2012

Mr. Ray Klimcsak
U.S. Environmental Protection Agency – Region 2
290 Broadway 19th Floor
New York, New York 10007-1866

RE: Sherwin-Williams/Hilliards Creek Site- Former Manufacturing Plant
Gibbsboro, New Jersey
Administrative Order Index No. II CERCLA-02-99-2035

Response to USEPA and NJDEP May 2, 2012 Comments on
January 20, 2012 *Revised Work Plan for Additional
Groundwater Characterization*

Dear Mr. Klimcsak:

On May 7, 2012, The Sherwin-Williams Co., Inc. (Sherwin-Williams) received from the United States Environmental Protection Agency (EPA) comments from the EPA and the New Jersey Department of Environmental Protection (NJDEP) on the Revised Work Plan for Additional Groundwater Characterization for the Former Manufacturing Plant (FMP) area of the Hilliards Creek Site (EPA Letter dated 2 May 2012).

The comment letter provided approval for Sherwin-Williams to begin performing portions of the supplemental groundwater investigation at the FMP area, and requested additional information on other portions of the investigation. Following receipt of the comments, Sherwin-Williams began preparations for implementation of the approved field activities and responded to several information requests so that additional field activities could also be initiated as soon as possible. All field work performed since receipt of the comments and submission of this Response to Comments has been conducted with EPA approval.

Because of the effort to immediately initiate the approved portions of the investigation, some of the work covered by the comments is already underway, and much of the additional information requested by EPA and the NJDEP including information pertaining to the innovative site characterization technologies and the shallow/intermediate groundwater screening program, has already been provided to EPA. Therefore, in some instances, the response to the EPA or NJDEP comment will

note that field work has already been conducted or the information has previously been provided.

This Updated Revised FMP Groundwater Work Plan consists of Revised Sections 1, 4 and 5 from the January 20, 2012 Revised FMP Groundwater Work Plan. Sections 2 and 3 have not been revised, but have been included for the completeness of this document. The format of this updated revised work plan has been discussed with EPA. Also included with the work plan are:

- Revised Table 1 – Groundwater Monitoring Wells - Bottom Depth and Screened Intervals Summary
- Revised Table 8 – FMP Groundwater Investigation - Proposed Shallow Groundwater Sampling Summary
- Revised Table 9 – FMP Groundwater Investigation - Proposed Soil Sampling Summary
- Revised Table 10 – Proposed Monitoring Well Sampling Summary
- Revised Table 11 – FMP Groundwater Investigation – Shallow and Intermediate Groundwater Screening Locations
- Revised Figure 14 – Proposed Shallow Groundwater and Monitoring Well Investigation Map
- Revised Figure 15 – Innovative Investigation Technology Decision Matrix (Seep Area and MW-30 Area)
- New Figure 16 – Proposed Innovative Technology Pilot Test Locations
- Appendix B – Proposed Schedule for Groundwater Investigation
- Appendix C – Hydrophobic Dye Test Standard Operating Procedure (SOP)
- Appendix D – Electrical Resistivity Bench-Scale Testing Standard Operating Procedure (SOP)
- Appendix E – Statement of Qualifications for Innovative Technology Subcontractors

All other tables, figures and appendices from the January 20, 2012 Revised Workplan for Additional Groundwater Investigation remain the same.

The following Response to Comments is organized as per the EPA May 2, 2012 comment letter, and the responses are provided to the three attachments. To allow for

easier review, the EPA and NJDEP comments are presented in italics, and the response follows.

Should you have any other questions or comments, please do not hesitate to contact me at (216) 566-1794 or via e-mail at mlcapichioni@sherwin.com.

Sincerely,



Mary Lou Capichioni
Director Remediation Services

Encls.

cc: J. Josephson, EPA (New York)
W. Sy, EPA (Edison)
L.Vogel, NJDEP, (4 copies)
M.LaMacchia, HDR
N.McFadden, Brandywine
B. Molotsky, Brandywine
B. Katcher, Manko, Gold, Katcher & Fox, LLP
J. Gerulis, Sherwin-Williams (w/o enclosures)
A. Danzig, Sherwin-Williams (w/o enclosures)
S. Peticolas, Gibbons, Del Deo, Dolan, Griffinger, & Vecchione (w/o enclosures)
H. Martin, ELM
R. Mattuck, Gradient
S. Jones, Weston Solutions
S. Clough, Weston Solutions
A. Fischer, Weston Solutions

SHERWIN-WILLIAMS RESPONSES TO ATTACHMENT I

Elements of the draft Work Plan approved for immediate implementation:

1. *EPA approves down-hole geophysics (gamma logging) activities at the wells currently proposed in the table (Section 4.2.1, page 26) of the draft Work Plan. However, please clarify if the field activities will be performed by a subcontractor. Please provide EPA with their qualifications.*

Response: Qualifications for all subcontractors have previously been provided to the EPA. The qualifications are also included on the attached CD.

2. *Due to the fact that Monitoring Well 42 (MW-42) was not located until after groundwater monitoring wells sampling activities were completed, EPA is requesting that this well be sampled, prior to waiting until "new" wells are installed and developed. In addition, since the data from the following wells may impact future decisions on poly-aromatic hydrocarbons (PAHs) previously detected in MWs: 15, 16, and 19, EPA is requesting that these wells be sampled as proposed (for filtered and unfiltered collection). It is stated that the rationale for collecting samples for PAH analysis from MW-15, MW-16, and MW-19 is based on the fact that PAHs were detected in consecutive rounds of sampling (2009 and 2010). However, it should be noted that PAHs were also present in MW-20 (co-located with MW-19) and MW-33. Target 35 (T-35) was investigated on 4/15/10 (within the vicinity of MW-33) and it was revealed that there was black colored soil that had a petroleum odor, along with "white material" that had exceedances for lead and arsenic according to the XRF. No confirmatory samples were collected.*

Response: MW-15 was sampled on June 19, 2012. MW-16 and MW-42 were sampled on June 14, 2012. MW-19 was sampled on June 15, 2012. In addition, as requested by EPA during the conference call of May 9, 2012, MW-20 and MW-33 were also sampled, on June 19, 2012 and June 15, 2012, respectively.

3. *EPA approves the field activities proposed to perform hydraulic testing as proposed in Section 4.5, page 37. EPA is aware of the fact that 3 of the 19 monitoring wells, where these activities are proposed, are not yet installed; however, it is EPA's opinion that the information from the 16 existing wells could be beneficial and may shed insight if any changes to the 3 proposed wells are required prior to their installation. Once these three additional wells are installed, the hydraulic testing can be performed and updates to the overall Site conditions can be made.*

Response: The hydraulic testing was performed June 7, 2012 – June 13, 2012.

4. *Pilot Application of Innovative Site Characterization Technologies (Section 4.2) and Benzene Source Area Investigation (Section 4.4.1).*-Various technologies have been proposed for use as part of a pilot study. A "decision-matrix" (Figure 15) has been included to guide the reviewer in assessing how decisions will be made to either retain, or exclude the technologies; however, little insight is provided as to "who" will be making the specific decision criteria, in what formats would reports be available, timeline for submittal of "reports", and whether they will be provided to EPA and NJDEP before any decisions are made to retain/exclude technologies. EPA and NJDEP have expressed the position that these technologies may be beneficial to the overall field investigation activities and agree that they should be employed. However, EPA is requesting the following conditions:

- EPA is requesting that the innovative site characterization technologies: Membrane Interface Probe (MIP), Electrical Conductance (EC), Ultra-Violet/Laser-Induced Fluorescence (UVIF/LIF) be utilized not only in the deep aquifer (within the vicinity of MW-30) but also the shallow aquifer at 4 locations as specified by EPA. When data is generated, EPA is requesting to review it, prior to Sherwin-Williams submitting their own evaluation of the data. Consideration of additional locations will be assessed after the data is reviewed.
- EPA agrees that, based on the data generated, additional soil and groundwater sampling may be required. However, page 32 alludes to the fact that soil samples will be collected during implementation of these innovative technologies. There is very little information provided as to the number of samples, or analysis to be performed. In addition, it is not apparent when this will be done, nor when the data will be available. EPA is requesting additional information on this proposed activity prior to approving it.

Response: The following was previously provided to the EPA on June 6, 2012. For purposes of completeness, the response is included herein. The attachments provided to the EPA on June 6, 2012 along with this response are provided as Appendix 1 to this Response to Comments.

The EPA comment has several components. Each is addressed individually below.

- a. *Who will make decisions as to whether one or more of the technologies will be applied on a more wide-spread basis in the field?*

The decision to further utilize one or more of the innovative site characterization technologies will be made in consultation with EPA. Sherwin-Williams will provide to the EPA copies of the reports provided by the subcontractors for review immediately upon receipt so that Sherwin-Williams and EPA can concurrently review the initial results. Sherwin-Williams will then provide to EPA its evaluation of the data and recommendations to either perform a more wide-spread application of a technology or to exclude the technology from further use. The rationale for the recommendations will be provided. Sherwin-Williams and EPA can then discuss Sherwin-Williams'

recommendations and, as needed based on EPA review and independent evaluation of the subcontractor reports, the recommendations can be revised and a work plan/technical memorandum presenting the details of further application of one or more technologies will be prepared.

b. What will be the format and timing of reports provided to EPA and NJDEP?

As stated above, it is Sherwin-Williams' intent to provide to EPA and NJDEP copies of the subcontractor reports when they are received from the subcontractor and prior to detailed review and analysis by Sherwin-Williams. In this manner, both Sherwin-Williams and EPA can concurrently review the initial results.

The attached figures (see Appendix 1) provide typical output summaries for the UVIF/LIF and MIP technologies. Note that these figures were obtained from other sites and are provided only as typical examples of the subcontractor reports that will be provided to Sherwin-Williams and EPA. Additionally, these logs were generated more than two years ago, and the technologies have advanced considerably. Nonetheless, they provide reasonable examples of the type of information that will be generated by these technologies.

Two figures for each technology are provided. One provides a log where a response was observed, while the other provides a plot where no response was observed.

UVIF/LIF Logs

As shown, the fluorescence is measured in volts. In the examples provided, the responses were measured on a scale of 0-1 and 0-6 volts. In addition to the UVIF/LIF responses, the reports will also provide information on the lithology, typically obtained from one or more measurements made by the cone penetrometer pushing the UVIF/LIF module. In the example provided, the lithology was obtained from a series of measurements of tip resistance (qt), sleeve friction (fs) and dynamic pore pressure (u). Note that the reported lithology is based on correlations that have been developed from many years of cone penetrometer use in geotechnical investigations.

As shown on the log where a response was observed (CPT 01), the response began at a depth of approximately 7 feet, or immediately below the water table, and extended to approximately 14 feet. The soils in which the response was observed were determined to be sands based on the cone penetrometer data.

In the other UVIF/LIF log (CPT-13), no real UVIF response was observed. In this case, it may be that the sensitivity was not great enough to detect any petroleum that may be present (the response was set at 6 volts) or there may not have been any significant amount of petroleum in the boring.

MIP Logs

In the example MIP logs, three physical parameters, conductivity, the speed of the probe, and temperature, are presented along with three semi-quantitative indicators of the presence of volatile organic compounds: 1) photoionization detector (PID); 2) flame ionization detector (FID); and 3) electron capture detector (ECD) readings. In some instances a gas chromatograph (GC) can be used. In the example logs provided the detection devices were limited to the PID, FID and ECD.

On the log of MIP-17, there is a clear spike at a depth of approximately 10 feet in both the FID and ECD readings, indicating the presence of volatile organic compounds (VOCs) at this depth. There was no PID response, suggesting that the VOC was likely a chlorinated solvent, and the PID lamp may not have been properly sized to detect the VOC.

Conversely, as shown on the log for CPT-06, there was no response in any of the three indicators of the presence of contamination. In this case, no VOCs were detected.

Additionally, the EPA provided on June 11, 2012, two additional comments to the above response:

- **Page 3, sub-part "c"** - *It's stated that the preliminary pilot application would be performed in both areas of known contamination and also areas known to be free of contamination. EPA is requesting that the number and locations of "points" to be investigated that are known to be free of contamination be depicted in a figure. EPA is requesting that the following figure (provided by Weston) be updated to depict the locations being proposed by Sherwin-Williams, and those requested by EPA. **The updated figure can be incorporated into the Tech-Memo (discussed on 6/7/12 call), in which the means to finalize the January 2012 Work Plan was discussed.*

Response: The updated figure was provided to EPA on June 13, 2012 and is included with the Updated Revised FMP Groundwater Work Plan (Figure 16) that presents the revised scope of work for the FMP groundwater investigation.

- **Page 4, sub-part "d"** - *It is stated that Sherwin-Williams will discuss with the selected MIP subcontractor whether they are willing to conduct a MIP investigation in an area known to contain residual product. Is there an answer for this yet?*

Response: Based on the EPA request to conduct the MIP investigation in the Seep Area, Sherwin-Williams has had discussions with the MIP contractor and concluded that, rather than utilizing a field GC, the MIP will use a PID, FID and ECD as the analytical tools. In this manner, the risk of overloading the GC during testing is reduced, and the MIP can be used in the Seep Area.

c. What criteria will be utilized to determine whether a technology should be retained or excluded?

As suggested by the example response logs, it will be difficult to establish a firm set of quantitative criteria by which to evaluate the innovative technologies. If the subcontractor reports are similar to the plots where strong responses were observed, it will be relatively straightforward to conclude that the technology (or technologies) can be applied to the site. Similarly, if no, or minimal, responses are observed in locations where previous investigations have confirmed the presence of contaminants that should be detected by the technology, then it would likely be concluded that the technology is not suitable for the site. However, it can be predicted that not all of the results will be as straightforward as the example logs provided (see Appendix 1), hence the proposal for performing a preliminary limited pilot application prior to a full-scale application. As stated above, the preliminary pilot application would be performed in both areas of known contamination and also areas known to be free of contamination in order to evaluate the response of the instrument relative to known site conditions.

Therefore, the conclusions that will be reached regarding whether to retain and further use, or to exclude, a technology will need to be made using professional judgment. As discussed previously, it is Sherwin-Williams' intent to provide to EPA and NJDEP the subcontractors' reports when received so that EPA, NJDEP and Sherwin-Williams can review the results concurrently. Sherwin-Williams will then provide to EPA its recommendations and all parties can then determine which, if any, technologies will be further used.

d. Use of Membrane Interface Probe (MIP), Electrical Conductance (EC), Ultra-Violet/Laser-Induced Fluorescence (UVIF/LIF) in Seep Area

It has always been Sherwin-Williams' intention to apply the EC and UVIF/LIF technologies in the Seep Area. The fluorescence technology is typically used to determine the extent and relative saturation of petroleum, and the field application of these technologies was initially focused on the Seep Area. Similarly, the EC, along with other physical parameters collected by the cone penetrometer sensors, will be used in the evaluation of lithology. The purpose of the initial evaluation of the fluorescence technology is to assess whether the composition of the residual petroleum in the Seep Area will respond to the technology. In general, it is the polynuclear aromatic hydrocarbons (PAHs), including naphthalene, that fluoresce, and it is not currently known whether the degraded mineral spirits, as has been fingerprinted, will respond to the technology.

Sherwin-Williams will discuss with the selected MIP subcontractor whether they are willing to conduct a MIP investigation in an area known to contain residual product. If so, the requested analyses will be conducted.

NOTE: Subsequent to providing the above response to the EPA, Sherwin-Williams discussed with the MIP subcontractor EPA's request that the MIP technology be field-

tested in the Seep Area. As a result of the discussions, it was concluded that the MIP would use a PID/FID/ECD set of sensing technologies rather than a GC. Therefore, the MIP investigation will be conducted in the Seep Area.

- e. Provide further clarification on soil sampling during implementation of the innovative site characterization technologies*

Soil samples will not be collected during the initial phase of application of the innovative site characterization technologies. As discussed previously, the UVIF/LIF and MIP devices will be pushed with a direct push rig in conjunction with a cone penetrometer type unit. As such, no soil cores will be obtained during this phase of the investigation.

Based on the results of the initial application of one or more of the technologies, a decision to return and collect soil samples may be made. For example, if, in the MW-30 area, there is a significant MIP response at a depth corresponding to the deep benzene in groundwater, a targeted investigation would most likely be designed for this area and soil samples collected at the depth where the MIP response was observed.

5. *EPA approves the use of electrical resistivity (ER) testing within the Seep Area. As discussed in Comment #4 above, EPA is requesting that the innovative technologies be employed at 4 locations throughout the Seep Area (and other areas previously investigated which revealed: odor, product-like detections, and high photo-ionization detector readings). Sherwin-Williams provided a figure (Figure 1-"Proposed Innovative Technology Locations", dated April 5, 2012, posted on Weston Solutions "TeamLink" website) with a proposed location within the Seep Area. EPA approves this location. In addition, please provide EPA with the information regarding the type of resistivity measurement that will be conducted. Currently it is only stated that "bulk" resistivity will be conducted. Please clarify if there will be a single Ohm range with Specific Resistance or if the use of R8, R16, and R32 Ohm ranges will be used.*

Response: Under the testing procedures contemplated for determining soil resistivity, the soil resistance (ohms) and resistivity (ohm-meters or ohm-centimeters) will be calculated, and not applied. Therefore, no specific resistance value or values will be used. Additional detail is presented below.

The "bulk" resistivity term refers to the resistivity value of earth materials, typically reported in ohm-centimeters or ohm-meters. An array of electrodes will be installed in the soil, either ex-situ during the bench-scale testing, or in-situ if field-scale application is conducted. A known current (measured in amperes) and voltage is applied at some of the electrodes and the resulting voltage (or drop in electrical potential) is measured at electrodes located a known distance from the location(s) where the current was applied. Using Ohm's Law (Resistance [ohms] = voltage [volts] /current [amperes]), the "bulk" or "apparent" resistance can be calculated. Based on the distance from the point where the current was applied, the resistivity in ohm-meters is then calculated. In a field application, the resistivity is calculated using the formula:

Resistivity (ohm-meters) = $2 \pi AR$,

where A = distance and R = Resistance .

For example, if a current of 20 amps is applied in one location and a voltage drop of 40 volts is measured 5 meters away, the calculations for the soil resistance and resistivity would be;

Resistance (ohms) = 40 volts/20 amps = 2 ohms

Resistivity (ohm-meters) = $2 \pi AR = 2 * 3.14 * 5 * 2 = 62.8$ ohm-meters

The calculated resistivity will be a function of many variables including, but not limited to, lithology, porosity, degree of saturation, pore space groundwater composition, anions and cations, and temperature. The purpose of the bench scale testing is to determine whether the degree of petroleum saturation will affect the ability of the soil to conduct a current. If the bench-scale testing determines that the degree of petroleum saturation does influence the soil resistance, as calculated above, the technology will be considered for field application.

As presented above, the resistance and resistivity are calculated, not applied. Therefore, it is not possible to respond directly to the EPA comment. If additional information is required, however, direct conversations with our subcontractors can be arranged.

6. EPA previously requested that shallow groundwater screening activities be performed throughout portions of the FMP area, the Sherwin-Williams Company agreed to perform these activities. EPA's request for this work was based on existing data gaps (where no samples existed) and on historic features related to past manufacturing and product/materials storage and transportation (i.e. rail line spurs which included material/product transferring stations) activities. Based on review of information presented by the Sherwin-Williams Company in the revised Work Plan and a more recent review of available data and information, EPA is requesting several additional changes to the proposed shallow groundwater screening activities.

Soil Sampling - In addition to agreeing to perform the requested shallow groundwater screening activities presented by EPA, the Sherwin-Williams Company also proposed to collect soil samples during sampling activities. EPA approves of the soil sampling, however, in addition to the list of analytical methods described on page 22 and 23, EPA is also requesting that soil samples be submitted for Total Petroleum Hydrocarbon analysis at the same intervals as the other samples are to be collected.

Response: The soil samples will also be analyzed for total petroleum hydrocarbons (TPH) using NJDEP Method OQA-QAM-025-02/08 as requested by EPA and NJDEP. The additional analytical parameter is specified in the Updated Revised FMP Groundwater Work Plan.

Shallow Groundwater Screening Activities and EPA's request for additional sampling of Intermediate Groundwater (zone) Screening Activities Within the revised Work Plan the Sherwin-Williams Company has presented the following groundwater depth intervals/classifications (page 6): shallow groundwater (0'-20' below ground surface), intermediate groundwater (20'-45' bgs) and deep groundwater (greater than 45' bgs). Review of the information on the existing on-site monitoring wells reveals that there are approximately only "3" monitoring wells which could be classified as "intermediate". In some cases, the intermediate depth interval is the interval for which data/information is lacking (a potential data gap). For example, within the former Lagoon Area there are several shallow wells which contain the compound pentachlorophenol above the NJDEP GWQS. Conclusions are presented in the revised Work Plan which state that the extent of pentachlorophenol contamination (for all depth intervals) is delineated within the lagoon area, however, there is only one well not installed in the shallow interval (MW-37) and it is screened from 56-68 feet. Review of the past boring log for MW-37 reveals that there was "product-like" material noted in depths ranging 12-35 feet deep. EPA is now requesting that several of the proposed shallow groundwater sampling points be relocated and sampled at intermediate intervals. Incidentally, the sampling may also fill portions of an existing data gap, which is discussed on page 36.

Response: The EPA comment is correct; there are few monitoring wells installed at intermediate depths across the FMP. This is a function of the focus of the groundwater investigation on: 1) assessing the groundwater impacts from the residual petroleum material found in shallow groundwater in the former Resin Pant and Tank Farm A areas; and 2) delineating the extent and the source(s) of the benzene found in deeper groundwater. The data that have been collected from the wells installed in the intermediate zone (MW-1, MW-19, MW-20, MW-22, MW-29) have supported the conclusion that groundwater in the intermediate zone did not, in general, contain elevated levels of site-related constituents. For example, while benzene concentrations in shallow groundwater in the former Tank Farm A area (MW-11) ranged from 99 – 190 ug/l, and in deep groundwater (MW-30) ranged from 3,500 – 3,900 ug/l, benzene concentrations in the intermediate zone (MW-19) ranged from less than the GWQS (1 ug/l) to 7.5 ug/l.

Additionally, it is noted that the conclusions in the revised FMP work plan were factual. The work plan stated that there was no need to install additional monitoring wells to horizontally delineate the pentachlorophenol in shallow groundwater monitoring wells because only low levels of pentachlorophenol were found in MW-2 and MW-23, and the pentachlorophenol found in MW-4 was delineated downgradient at MW-38. Additionally, it was stated that the shallow groundwater screening planned for this area

would provide additional information regarding the distribution of the pentachlorophenol in groundwater.

Sherwin-Williams has reviewed the well log for MW-37 (attached as Appendix 2 to this Response to Comments), and has been unable to find a reference to “product-like” material, as cited by the EPA in its comment. Rather, to be clear, the well log notes at several specific intervals from 12’ – 26’ feet that the “soil is stained and has a petroleum-like odor”. There is no specific reference to a “product-like” material, and the last reference to odor and staining is at 26’.

The shallow and intermediate groundwater sampling as requested by EPA began on June 25, 2012. Figure 14 of the Updated Revised FMP Groundwater Work Plan shows the locations of the shallow and intermediate groundwater sampling locations, and the sampling technique is discussed in the Updated Revised FMP Groundwater Work Plan.

On page 36 of the revised Work Plan it is stated that "only one well (MW-32) provides lateral definition (of the benzene plume) to the east (currently the Sherwin-Williams Company is proposing one shallow well and one "deep" well) and two wells (MW-31 and MW-37) provide lateral definition to the west (however, no wells are proposed). The screened intervals for MW-31, MW-32, and MW-37, are: 72'-77' bgs, 72'-77' bgs, and 58'-68' bgs respectively. Therefore, samples will be shifted to address the intermediate groundwater zone in these areas.

Response: The portion of the revised FMP Work Plan cited by the EPA specifically addressed the benzene found in deep groundwater. MW-31 and MW-37 do provide lateral delineation of benzene in deep groundwater to the west, and MW-32 is the only well providing lateral delineation of the benzene in deep groundwater to the east. The additional deep monitoring well proposed in the work plan was designed to delineate the lateral extent of benzene in deep groundwater to the east. The shallow well to the east is designed to confirm horizontal delineation to the east for the benzene found in the shallow wells MW-13R, located in the northeast corner of the Seep Area, and MW-26, located in the former Gas Station, upgradient of the proposed shallow well. The objectives for the proposed shallow and deep monitoring wells are consistent with the overall focus of the groundwater investigation discussed above: 1) the impacts from the residual petroleum material on shallow groundwater and 2) the benzene in deep groundwater.

Similar examples of potential data gaps exist in other locations (where the intermediate interval was not sampled and either exceedances of GWQS existed or signs of product was present in the wells); therefore EPA is requesting that other sampling points be proposed in the intermediate intervals. EPA is not proposing to increase the number of locations currently proposed, but rather shift some locations and make them "deeper".

Response: The modified shallow and intermediate groundwater sampling program was initiated on June 25, 2012. The modified groundwater screening program is presented in the Updated Revised FMP Groundwater Work Plan.

While reviewing available information, EPA has discovered that the 2 Foster Avenue building was built sometime between the years of 1946 - 1951 (according to aerial photographs), however, former Tank Farm A was constructed and utilized in the 1880's (according to Sherwin-Williams 2001 RI Report to the NJDEP). It is possible that a source of benzene contamination may exist in the vicinity under the 2 Foster Avenue structure. Historic figures indicate that benzene was stored in large quantities in former Tank Farm A and to a lesser extent in the area of the former Resin Plant area. In addition, Figure "Tank Schedule_Historic" indicates that the area leading from former Tank Farm A was "slope to ditch - culvert under building". The overall shallow groundwater flow originating from former Tank Farm A is in the direction beneath the 2 Foster Avenue building and the Seep Area.

Response: Sherwin-Williams has historically acknowledged that the data collected from the perimeter of the 2 Foster Avenue building supported a conclusion that residual petroleum material is likely present beneath the building. Evidence of the residual petroleum material (elevated PID readings and staining) has been observed in borings collected immediately north (in the former Tank Farm A area) and south (along Foster Avenue) of the 2 Foster Avenue building. Therefore, it can be concluded that residual petroleum contamination is likely present beneath the building. Figures presenting the inferred extent of the residual petroleum material were previously presented in the Comprehensive Paint Works Remedial Investigation Report, and the Revised Vapor Intrusion Pathway Evaluation and Indoor Air Sampling Plan, both provided in May 2007. The supplemental data that have been collected subsequent to these reports has better refined the extent of the residual petroleum material, and the data continue to support the conclusion that residual petroleum material is present beneath 2 Foster Avenue.

It can also be projected that the characteristics and vertical distribution of the residual petroleum material beneath 2 Foster Avenue are similar to those of the petroleum material present in the former Tank Farm A area. As noted in the EPA comment, benzene and other petroleum products were stored in large volumes in the former Tank Farm A area. Based on these historical operations and the soil data that have been collected, it can be concluded that operations in the former Tank Farm A area were the likely sources of the historical discharges of residual petroleum material in this general area. The residual petroleum contamination beneath 2 Foster Avenue would therefore be a result of either the overland transport mechanism cited above by the EPA or subsurface transport of free product from the former Tank Farm A area.

Since the source(s) of the residual petroleum material beneath 2 Foster Avenue were the same as the source(s) of the residual petroleum material in the former Tank Farm A area, and the transport and degradation processes would be the same, it can be concluded that the characteristics and vertical extent of the residual petroleum material

beneath 2 Foster Avenue are similar to those immediately upgradient of the building. The soil and groundwater data collected within the former Tank Farm A area can be relied on, therefore, to characterize the composition and vertical extent of the residual petroleum material.

The Seep Area lacks any proposed locations (currently) in the area between the southern side of United States Avenue, and 1 and 5 Foster Avenue structures. Product has been noted in the most "northern" trench box along Hilliard's Creek, former soil vapor extraction (SVE) vents: H-1P and H-3P, Well Point (WP-1), geophysical anomaly Target (T-11), Hilliards Creek Soil Sample HCSB0294 (between 4.0 -4.5 ft, but not sampled deeper), and MW-13R. Various screening technologies have also indicated impacted soils; however, the vertical extent has never been delineated. Additionally, there appears to have been a rail tanker car pump station (apparently pumping materials towards former Tank farm B), several other rail spurs and above ground (and potentially underground) piping networked through the former Main Plant.

Table 1 -Shallow and Intermediate Groundwater Screening Points

| | |
|----|--|
| 1 | Keep as proposed |
| 2 | Currently not requesting at this time |
| 3 | Keep location, convert to intermediate depth |
| 4 | Keep as proposed |
| 5 | Keep as proposed |
| 6 | Keep as proposed |
| 7 | Keep location, convert to intermediate depth |
| 8 | Keep location, convert to intermediate depth |
| 9 | Currently not requesting at this time |
| 10 | Keep location, convert to intermediate depth |
| 11 | Keep as proposed |
| 12 | Keep location, convert to intermediate depth |
| 13 | Keep as proposed |
| 14 | Keep location, convert to intermediate depth |
| 15 | Keep as proposed |
| 16 | Shift location approximately 100 ft north, keep shallow point |
| 17 | Keep as proposed |
| 18 | Keep location, convert to intermediate depth |
| 19 | Currently not requesting at this time |
| 20 | Keep as proposed |
| 21 | Currently not requesting at this time |
| 22 | Keep as proposed |
| 23 | Currently not requesting at this time |
| 24 | Shift location approximately 100 ft. south, keep shallow, include intermediate |
| 25 | Keep as proposed |
| 26 | Currently not requesting at this time |

| | |
|----|--|
| 27 | Shift location approximately in the center of MW-16 and MW-18. Keep shallow, include intermediate. |
| 28 | Currently not requesting at this time. |
| 29 | Shift location approximately 75 ft. west. Keep shallow, include intermediate |
| 30 | Shift location approximately 100 ft. west. Keep shallow, include intermediate |
| 31 | Keep location, include intermediate |
| 32 | Keep location, include intermediate |

Response: The revised shallow and intermediate groundwater screening program as requested by the EPA was initiated on June 25, 2012. It is noted that, based on discussions with EPA, some changes to the shallow and intermediate groundwater screening program were made subsequent to receipt of the May 2, 2012 comment letter. The final shallow and intermediate groundwater screening program as approved by the EPA is presented in Table 11 of the Updated Revised FMP Groundwater Work Plan.

SHERWIN-WILLIAMS RESPONSES TO ATTACHMENT II

General Comments:

1. *The revised (January 2012) Groundwater Work Plan included field activities ("Pilot Activities") which were not presented in the draft (June 2011) Groundwater Work Plan. EPA and NJDEP have both expressed mutual concurrence on the use of these "Pilot Activities", which include: MIP investigation, ER testing, UVIF/LIF, EC, and down-hole geophysics (gamma- logging); however, there (as described in the comments) are concerns as to how decisions will be made with the data and how it will impact the overall Remedial Investigation activities and ultimately the installation of additional monitoring wells (shallow, intermediate, and deep). In addition to requesting additional information on how the data will be interpreted and what impacts it may have on future field activities, EPA and NJDEP are also requesting that all contractors/subcontractors (including laboratories) qualifications be provided to NJDEP and EPA.*

Response: The approach to decision-making based on the results of the initial application was presented to the EPA on June 6, 2012, and has been included as the response to Comment #2 of Attachment #1. The subcontractor qualifications were also previously provided and are included on the CD attached to this Response to Comments.

2. *The Sherwin-Williams Company has presented several Conceptual Site Models (CSMs) within the revised Groundwater Work Plan, which are to be believed as possible models to explain groundwater contamination. EPA is presenting an alternate CSM for the possible source of the deep benzene contamination, in which a source may exist under the 2 Foster Avenue (and 3 United States Avenue) structure. Historic figures and reports (2001 NJDEP RI Report) indicate that former Tank Farm A existed in the same spot since the 1880's and that the run-off from the tank farm itself was "sloped to ditch" and "culvert under building". In addition, the 2 Foster Avenue structure was built sometime between 1946 and 1951 (according to available aerial photographs). There were no large structures which existed in the current 2 Foster Avenue footprint prior to 1946. In addition, figures which were previously submitted by the Sherwin-Williams Company (Figure 9, September 21, 2006) indicate areas of potentially product- impacted soils (also inferring that a large extent exists under the 2 Foster Avenue building. The September 21, 2006 report, is the "Vapor Intrusion Pathway Evaluation and Indoor Air Sampling Plan for the Paint Works Property", which was never implemented, because ultimately EPA conducted the sampling, however, the sampling plan included a summary of previously collected data. Essentially, EPA is requesting that sampling be proposed under the 2 Foster Avenue structure.*

Response: Sherwin-Williams is asking that EPA reconsider its request to conduct sampling beneath the 2 Foster Avenue building. As presented in the response to Comment #6 in Attachment #1, it can be predicted that the characteristics and vertical extent of the residual petroleum material beneath the building are similar to those observed in the petroleum material located immediately adjacent to the building. The source(s) of the material were most likely the operations conducted in former Tank Farm A, and the presence of the residual petroleum material beneath 2 Foster Avenue a result of the overland transport referenced by the EPA and/or subsurface transport of the residual petroleum material. Further, the mechanisms that would affect the fate and transport of the residual petroleum material would be similar regardless of whether the residual petroleum material was located immediately adjacent to or beneath the 2 Foster Avenue building, or the mechanism (overland or subsurface) by which it was transported beneath the building.

Based on the soil and groundwater data collected from the former Tank Farm A area, it can be concluded that the residual petroleum material beneath the 2 Foster Avenue building:

- Is primarily a degraded mineral spirits, as documented by several fingerprinting analyses.
- Contains few target analytes, and those that are present, such as benzene, naphthalene, ethylbenzene, and xylenes, are present at relatively low levels (see product analysis, August 2011).
- Extends to depths less than 25 feet. Neither PID readings (see Figure 13 from the FMP Site Evaluation Report) nor soil sampling results (see Figure 9, FMP Site Evaluation Report) documented any evidence of the presence of the residual petroleum material at depths greater than 25 feet. In particular, the PID results for borings MPSB0016 (located near MW-11) and MPSB0017 (located at the corner of 2 Foster Avenue and 4 Foster Avenue) document that the residual petroleum material extends no deeper than 15 feet.
- Acts as a source of dissolved-phase benzene and, occasionally, naphthalene in shallow groundwater, as presented in the FMP Groundwater Evaluation Report.

The presence of the residual petroleum material beneath 2 Foster Avenue does not necessarily provide an alternative conceptual model regarding the benzene in deep groundwater. In particular, it does not explain why the benzene concentrations in deep groundwater are more than an order of magnitude greater than those in shallow groundwater, while benzene concentrations in intermediate groundwater in Tank Farm A achieve or approach the GWQS (see results from MW-11/MW-19/MW-30). As discussed previously, it can be projected that the characteristics and vertical extent of the residual petroleum material beneath 2 Foster Avenue are similar to those of the material immediately north of 2 Foster Avenue, or even south for that matter. It can be concluded that the source(s) of the material were the same – historic operations in the

former Tank Farm A area – and the fate and transport mechanisms affecting the material would have also been the same. There is no basis to assume, for example, that the residual petroleum material beneath 2 Foster Avenue would extend 60 – 70 feet into the saturated zone, thereby acting as the source of benzene in deep groundwater, when the material immediately north of 2 Foster Avenue extends only 15 – 20 feet into the saturated zone.

Additionally, the 2 Foster Avenue building is downgradient of the MW-30 monitoring well cluster. If the residual petroleum material beneath 2 Foster Avenue was affecting deep groundwater, it would be predicted that the impacts would be observed south – downgradient – of the building, rather than upgradient.

Based on this analysis, Sherwin-Williams is asking that EPA reconsider its request to conduct sampling beneath the 2 Foster Avenue building. The data that have been collected from locations immediately adjacent to 2 Foster Avenue provide an understanding of the distribution and characteristics of the residual petroleum material.

It must also be noted that there are a number of technical and logistical challenges to conducting the interior sampling requested by the EPA that would need to be resolved prior to implementing EPA's request. These include the presence of a crawl space beneath the northern portion of the 2 Foster Avenue building (3 United States Avenue address), the ability to gain access to the building interior with equipment capable of achieving the desired sampling depths, the potential for structural damage to the building and the need to restore the building floor slab to the property owner's specifications. Further, as EPA recalls, even the vapor intrusion sampling, which was relatively non-intrusive compared to conducting interior soil sampling with a drill rig, was disruptive to both the building owner and the tenant. It can be predicted that property owner and tenant acceptance of a proposal to use a drill rig in the building interior will not be easily obtained.

Sherwin-Williams would be pleased to discuss further with EPA its data quality objectives for the interior sampling. It may be possible to achieve those objectives with an alternative sampling program.

Specific Comments:

- 1. Introduction - Please remove reference to the FMP "Site" Evaluation report and replace with FMP Area. Throughout the remainder of the Work Plan, reference to the FMP Area should be consistently used in lieu of: FMP Property or FMP Site.*

Response: The requested terminology is used on the Updated Revised FMP Groundwater Work Plan when speaking of the FMP. The term "Site Evaluation Report", which has been utilized previously for other areas of the Sherwin-Williams Hilliards Creek Site, will no longer be used.

2. Section 2.1, page 4- *In order for the reviewer to locate the information cited in this Work Plan, please provide the name of the document (being referenced) in which the "May 2007" site geologic conceptual model can be found. In addition, third paragraph - last sentence, it is stated that all four geology units are within the Composite Confining Bed, however, throughout the "Response to USEPA and NJDEP Comment" memorandum (dated January 20, 2012) it is stated that the geologic/hydrogeologic framework is under refinement and not finalized. Therefore, at this time, the last sentence of this paragraph should be removed.*

Response: As presented in Section 2.1, the initial identification and description of the stratigraphic units at the FMP were presented in the May 2007 Paint Works Comprehensive Remedial Investigation Report (RIR).

The sentence regarding the geologic units cited in the EPA comment stated that the current interpretation (emphasis added) of site hydrogeology was that the four units were in the Composite Confining Bed. This interpretation will be revisited and possibly revised when the data from the supplemental investigation are obtained.

3. Section 2.2, page 6 - *Three categories (shallow, intermediate, and deep) are used to designate what depths/intervals monitoring wells are located. While the depth ranges are provided for each of these categories, a table should be submitted which (with the given monitoring well corresponding to one of the three classifications) one can easily reference.*

Response: A table providing the requested information for both existing and newly installed wells has been provided in the Updated Revised FMP Groundwater Work Plan.

4. Section 3.1, page 10 - *First bullet, should also cite that benzene was found above the GWQS in the "Main Plant Area".*

Response: The comment is correct. The discussion of benzene in shallow groundwater will be expanded in the report documenting the results of the supplemental groundwater investigation to note that benzene was found in the Main Plant Area.

5. Section 3.1.1, page 11 - *The statement is made that several compounds (aluminum, iron, manganese, and sodium) are naturally occurring and warrant no additional investigation. However, as previously noted by EPA and cited in the 2001 NJDEP Remedial Investigation (report), alum was added to wastewater, prior to discharge to the on-site lagoons. EPA has, in the past, requested information regarding storage location, pumping location, and "alum" (product) make-up.*

Response: The conclusion that the four inorganic constituents are naturally-occurring was based on the presence of these constituents in every shallow groundwater

monitoring well, including MW-28, which is located more than 200 feet north (upgradient) of the FMP and well beyond the possible influence of any site-related discharge.

It is to be noted that these constituents have also been found in monitoring wells installed at the Burn and Dump Sites in locations where no site-related constituents have been found at levels greater than the GWQS. Based on the widespread occurrence of these constituents throughout the area, it is reasonable to conclude that they are naturally-occurring metals.

Sherwin-Williams will conduct a further review of historical site operations information to determine the handling and usage of the alum. If any additional information is obtained, it will be provided to the EPA.

6. Section 3.1.3, page 12 - *It is stated that MW-1 helps delineate the benzene contamination. While this may be true for benzene (which was not detected and happened to be have the following: 22 (U) and 10 (UJ); MW-1 did have numerous benzene tentatively identified compounds (TICs) which were present at high concentrations. MW-1 also had measureable product in the well. Although fingerprint analysis was not performed on a sample, in the past, it was shown to have the same characteristics of product material from the Seep Area. It should also be cited that naphthalene is present just below the GWQS.*

Response: It is acknowledged that the detection limits for benzene in MW-1 were elevated and greater than the GWQS.

The TICs cited in the comment were substituted benzene compounds and not the specific target analyte benzene. There are no specific GWQS for these constituents, although the State of New Jersey does have "Interim Generic Groundwater Criteria" for "Synthetic Organic Chemicals" that do not possess individual GWQS.

The EPA comments regarding the presence of product and its likely characteristics, and the presence of naphthalene at levels just below the GWQS are noted.

7. Section 3.1.3, page 12 - *MW-27 is stated as delineating the benzene plume, yet it has high benzene TICs.*

Response: As stated above, the TICs are substituted benzenes for which no individual GWQS have been established. The statement in the work plan that MW-27 delineates benzene to its specific GWQS is correct.

8. Section 3.1.3, page 12 - *It is stated that the benzene present above GWQS in shallow groundwater likely attenuates to the west in the Main Plant Area. While this*

may be possible, it is also possible that the culvert (connecting Silver Lake to Hilliards Creek) may itself act like a conduit for contamination. Please note, there are historic figures which indicate that there were other chemicals being stored, transported, loaded, and unloaded (and above ground storage tanks). Therefore the need for additional sampling (separate from that proposed by EPA to the east of the culvert) is being proposed to the western side of the culvert.

Response: The comment is noted and the shallow/intermediate groundwater screening program includes locations west of the culvert.

9. *Section 3.1.4, page 13 - It is stated that the arsenic exceedances in groundwater are not the result of anthropogenic sources, but rather localized changes in groundwater geochemistry. Yet, there is no discussion of the arsenic exceedances (which was subjected to XRF testing, but not confirmatory) which exist at previously investigated underground targets in 2010. Among them are: T-60 and T-54 at quite high levels, and T-21, T-22, T-23, and T-35. Also not discussed are the arsenic exceedances which are present throughout areas of the Former Main Plant Area. Finally, there has been no attempt by Sherwin-Williams to present a Conceptual Site Model to explain "how" the lead and arsenic are present at the headwaters of Hilliards Creek and pervasive as it leaves the Former Manufacturing Plant Area.*

Response: The discussion in the FMP Groundwater Work Plan cited the soil data presented in the FMP Data Evaluation Report that documented that arsenic is not widely found across the FMP at levels greater than the RDCSRS. As presented in the FMP Data Evaluation Report, arsenic and lead were not found at levels greater than the RDCSRS in any off-property study area, the former Lagoon Area, former Tank Farm A, or the Seep Area. In fact, with the exception of the samples collected along the proposed Silver Lake Conveyance Bypass and a few samples in the former Tank Farm A, former Tank Farm B and along Hilliards Creek, arsenic was present at low concentrations.

Arsenic was found in several shallow groundwater monitoring wells at levels moderately greater than the GWQS even though soil samples in the vicinity of the wells did not contain elevated levels of arsenic. Based on the absence of any identified sources of arsenic and the known behavior of arsenic in groundwater under reducing conditions, as has been extensively documented in the literature, the conclusion that the arsenic is a result of the geochemical conditions within the area of the residual petroleum material is supported.

The EPA's comment that arsenic was found in samples of material collected during the investigation of the geophysical targets is acknowledged. However, as discussed in the Response to the EPA Comments on the FMP Data Evaluation Report, the volume of material in the targets exhibiting the elevated arsenic levels was small, and there is no evidence that arsenic-containing material is present on a wide-spread basis throughout the FMP. Again, as summarized above and presented in the FMP Data Evaluation

Report, the soil data collected throughout the FMP provide evidence that arsenic is not widely found at levels greater than the RDCSRS in the FMP Area.

The EPA is correct in stating that Sherwin-Williams has not provided a detailed conceptual site model regarding how historical operations at the FMP may have resulted in the arsenic and lead found in downstream locations. The focus has been on delineating the extent of these constituents and investigating the FMP. Although, as EPA states, arsenic is found at elevated levels in downstream locations along Hilliards Creek, the data that have been collected support a conclusion that arsenic is not present at elevated levels across the FMP itself.

10. Section 3.1.5, page 15 - EPA will assess the data from the proposed shallow-groundwater screening effort to assess the claim that the compound naphthalene is delineated in the vicinity of MW-24. It should be noted that there are not many other wells in the vicinity which are screened at the same interval as MW-24. As a result, EPA is requesting some deeper groundwater screening points.

Response: The comment is noted, and the shallow/intermediate groundwater screening program includes locations in the vicinity of MW-24.

11. Section 3.1.6, page 15, It is stated that pentachlorophenol is present in MW-2, MW-4 and MW-23 - all wells are screened between 5 and 20 ft. The "closest" shallow well is screened at 58 ft below ground surface. Although this area is slated for shallow groundwater sampling, EPA is now requesting some additional deeper screening points (see Table 1, Attachment 1).

Response: The EPA's comment is noted and the shallow/intermediate groundwater screening program includes locations in the former Lagoon area.

12. General comment - A fair amount of the Work Plan is dedicated in an effort to determine if the FMP site is the source of the deep benzene. Various sampling technologies are presented and several Conceptual Site Models are presented. However, not discussed, but equally as possible is the fact that the building, "Two Foster Avenue" was a structure that was not added until sometime between 1946 and 1951. The building 2 Foster Avenue is located adjacent to former Tank Farm A. According to the 2001 NJDEP RI report (which indicates that Tank Farm A dates back to the 1880's) and other figures which indicate the lack of a large building (currently 2 Foster Avenue), reveals that an existing source of benzene could reside under 2 Foster Avenue and the parking lot near 1 Foster Avenue.

Response: As presented in the FMP Groundwater Work Plan, there are two potential conceptual models that may explain why benzene in deep groundwater is found at much greater concentrations than the benzene in shallow groundwater: 1) the benzene

originated on the FMP but natural mechanisms in shallow and intermediate groundwater have more effectively degraded the benzene than the mechanisms in deep groundwater; and 2) the benzene in deep groundwater originates off-property. The benzene source investigation is designed to determine which of these two conceptual models is valid.

Sherwin-Williams has historically acknowledged that residual petroleum material is most likely present beneath 2 Foster Avenue. However, it can be projected that the characteristics and extent of the residual petroleum material beneath 2 Foster Avenue are similar to those of the petroleum material observed immediately adjacent to the building. Further, the presence of the residual petroleum material beneath 2 Foster Avenue does not explain the key issue that is proposed to be investigated as part of the deep groundwater benzene source area investigation – why benzene concentrations in deep groundwater are an order of magnitude greater than those in shallow groundwater, while benzene concentrations in intermediate groundwater approach or achieve the GWQS. Additionally, the 2 Foster Avenue building is downgradient of the MW-30 well cluster. If a deep source of benzene was present beneath the 2 Foster Avenue building, it would be predicted to affect groundwater southwest of the building, in the direction of groundwater flow, not upgradient to the northeast.

13. Section 3.2, page 17- Earlier it is stated that, "For purposes of this report, only the geologic units will be referenced..", yet on page 17 (second bullet, it is stated that MW-30 is installed in the composite confining unit), which is not one of the 4 geologic units discussed on pages 4 and 5.

Response: The comment is acknowledged.

14. Section 3.2, page 17 - It is stated that the lateral extent of benzene is relatively small compared to its length. However, later on page 36 of the draft Work Plan it is more accurately stated that additional monitoring wells are being installed to delineate the lateral definition to the west and east.

Response: The EPA's comment is acknowledged. The purpose of the additional monitoring wells is to provide additional horizontal delineation data points laterally to the length of the plume. However, based on the current understanding of the extent of the benzene in deep groundwater, the downgradient extent is significantly greater than the lateral extent.

15. Section 4.0, page 20 - It is stated that one additional shallow monitoring well will be installed east of MW-13R. However, no additional wells are proposed for the area east of MW-1 and MW-11 where free-product has been found in wells, however, EPA has requested additional groundwater screening activities in the vicinity of these wells.

Response: The EPA's comment is acknowledged and the shallow/intermediate groundwater screening program includes locations in this area.

16. Section 4.1, page 23 - Please provide the standard operating procedure (SOP) for the hydrophobic dye-type screening method that will be used.

Response: The SOP for the hydrophobic dye screening was previously provided to the EPA and is attached as Appendix C to the Updated Revised FMP Groundwater Work Plan.

17. Section 4.1, page 23 – Earlier it is stated that in addition to soil samples being analyzed for Target Compound List (TCL) Volatile Organic Compounds (VOCs), TCL Semi-Volatile Organic Compounds (SVOCs) and Total Organic Carbon (TOC), it is stated that soil samples will be analyzed for Extractable Petroleum Hydrocarbons (EPH). However, later when the hydrophobic dye-type screening method is employed, this analysis (EPH) is not mentioned. In addition, being that a 2 inch core is being used, and there may be limited volumes of soil, which fraction is being collected first? Please outline the sample collection procedure and if any homogenization is necessary for any of the fractions.

Response: The boring will be inspected to identify the depth at which groundwater is encountered in order to provide a reference for the depth to water table as required for the shallow groundwater sampling program. Soil samples will be collected at the same sampling intervals as proposed for the shallow (the 0.0' – 1.0' interval of the water table interface and at the 9.5' to 10.0' interval below the water table interface) and intermediate (19.5' – 20.0' interval bgs and 29.5' – 30.0' interval bgs) groundwater sampling programs. Soil samples will be collected at each interval and screened for the presence of residual product-impacted soils or free-phase product (LNAPL) utilizing a hydrophobic dye-type screening method as described in the Standard Operating Procedure (SOP) contained in Appendix C. Laboratory samples will also be collected and submitted for TCL VOCs, TCL SVOCs, TPH and TOC analysis.

As previously discussed EPA and NJDEP have requested that the soil samples be analyzed for total petroleum hydrocarbons (TPH) using NJDEP Method OQA-QAM-025-02/08 instead of the EPH Method previously proposed in the January 20, 2012 revised work plan.

Additional cores will be advanced as necessary in order to collect sufficient volume for the proposed analyses. Samples will be collected and processed in accordance with the NJDEP Field Sampling Procedures Manual (August 2005) with VOCs being collected first and the remaining soil homogenized for the other remaining analyses.

18. Section 4.2, page 26 - *Uncertain what is meant by the statement that "...and providing accurate information, will be used at additional areas..." EPA is requesting the specific criteria which will be used to measure the "success" of utilizing the different technologies.*

Response: The language referenced by the EPA in its comment has been removed from the Updated Revised FMP Groundwater Work Plan. Additionally, Sherwin-Williams has previously provided to EPA a discussion of the types of results that can be expected from the proposed technologies (see response to Comment #4 of Attachment #1). Figure 15 of the Updated Revised FMP Groundwater Work Plan has been revised to more clearly summarize the decision-making process.

The decision to further utilize one or more of the innovative site characterization technologies will be made in consultation with EPA. Sherwin-Williams will provide to the EPA copies of the reports provided by the subcontractors for review immediately upon receipt so that Sherwin-Williams and EPA can concurrently review the initial results. Sherwin-Williams will then provide to EPA its evaluation of the data and recommendations to either perform a more wide-spread application of a technology or to exclude the technology from further use. The rationale for the recommendations will be provided. Sherwin-Williams and EPA can then discuss Sherwin-Williams' recommendations and, as needed based on EPA review and independent evaluation of the subcontractor reports, the recommendations can be revised and a work plan/technical memorandum presenting the details of further application of one or more technologies will be prepared.

19. Section 4.2.2, page 27 – *The activities which are presented here, being part of what Sherwin-Williams has proposed as the "benzene source investigation" includes various screening activities (i.e., gamma logging, MIP/UVIF/LIF, EC, etc.), but also alludes to the "possible" collection of additional soil and groundwater samples. The approach to how these future sampling activities (timeline and technologies) are to be employed need to be clearly stated here. In addition, all results from the screening activities are to be provided to EPA and NJDEP in summary in the form of a Technical Memorandum, along with any additional proposed work.*

Response: The gamma logging was conducted on June 4th and 5th 2012 as the first step in developing a more refined understanding of the geology in the deeper wells. The MIP will then be employed in the MW-30 area to develop an understanding of the vertical profile of the residual petroleum material and benzene, assuming that the technology is found to be useful. Using these results, the benzene source area soil and groundwater investigation will then proceed as presented in the Updated Revised FMP Groundwater Work Plan.

20. Section 4.2.3, page 28 – *Seep Area testing will be to: conduct ER bench-scale testing, UVIF/LIF, and based upon the results of the ER bench-scale, more ER.*

Please clarify if the UVIF/LIF will be performed in conjunction with the ER bench-scale testing. Please present more clearly, whether the UVIF/LIF will be performed at the same locations that the ER bench-scale samples are collected from. In addition, it is stated that the direct-sensing device will be pushed to a depth of 9.5-10.0 ft. It is uncertain what this depth is based on.

Response: Samples of soil containing product and soil with no product were collected on June 26, 2012 and provided to Rutgers University to determine whether there is a measurable and reproducible difference in the conductivity of the soil containing product as opposed to the soil that does not contain product. Based on this evaluation, a conclusion as to whether to proceed with field pilot testing of the ER technology will be made.

The UVIF/LIF does not need to be conducted at the same locations that the ER is performed. The two technologies are independent of each other, although it is intended that both provide a method by which to determine the extent of the residual petroleum material.

The 9.5' – 10.0' foot depth was selected to be consistent with the depth of the second shallow groundwater screening sampling interval. The language has been revised to state that if a LIF response is observed at the 9.5' – 10.0' Interval, the investigation will continue until there is no LIF response.

21. Section 4.3, page 28 – It is stated that one additional monitoring will be installed east of MW-13R to evaluate whether benzene is present in the shallow groundwater on the eastern side of United States Avenue. Please note that there is product in MW-1 and MW-11, both "north" of MW-13R and the extent of "product" is not delineated to the east.

Response: The EPA's comment is acknowledged. The area of potentially recoverable product has not been delineated to the north, and the extent of the residual petroleum material has not been delineated to the east. However, the extent of the residual petroleum material has been delineated to the north. It was concluded in the FMP Data evaluation report that several borings, including MPSB001, MPSB0002, MPSB0005 and MPSB0080 provided delineation of the residual petroleum material to the north. It was also concluded in the FMP Data Evaluation Report that additional delineation of the residual petroleum material to the east was needed. As presented in the FMP Data Evaluation Report, additional soil sampling was proposed on the east side of U.S. Avenue for the purpose of determining the horizontal extent of the residual petroleum material. The shallow/intermediate groundwater screening program includes locations east of MW-1 and MW-11.

22. Section 4.3, page 28 – EPA approves the following: unfiltered samples from MW-15, MW-16, and MW-19 for PAHs. In addition, MW-42 requires sampling since it was

found in 2010, after the sampling was completed, for full-scan parameters. EPA also approves of two additional rounds of water level measurements, including surface water measurements from: Silver Lake, Hilliards Creek, and Bridgewood Lake. The Sherwin-Williams Company is currently proposing to collect two full rounds of sampling from all existing and "new" monitoring wells; however, EPA is not currently requesting that existing monitoring wells be sampled two additional times.

Response: The EPA's comment is noted. MW-15 was sampled on June 19, 2012. MW-16 and MW-42 were sampled on June 14, 2012. MW-19 was sampled on June 15, 2012. On a May 9, 2012 conference call, EPA requested that filtered and unfiltered samples be collected from MW-20 and MW-33 for PAH analysis. MW-20 was sampled on June 19, 2012 and MW-33 was sampled on June 15, 2012.

Sherwin-Williams will collect one round of samples for analysis for full-scan parameters from all new wells. Based on these results and the results of the 2009 and 2010 sampling of the existing wells, Sherwin-Williams will propose to EPA in a technical memorandum a reduced set of parameters, if warranted. Once EPA concurrence with the proposed set of parameters is obtained, Sherwin-Williams will conduct one comprehensive round of groundwater sampling for all newly-installed and existing wells.

23. Section 4.3.3, page 31 - Earlier it was also discussed that surface water measurements would be collected at Bridgewood Lake, in addition to Silver Lake and Hilliards Creek. However, Bridgewood Lake is not discussed here, please clarify.

Response: Water level measurements will also be collected from Bridgewood Lake.

24. General Comment - There are portions of the text which state that soil samples will be collected and they will undergo analysis for TCL VOCs and TOC. Included with this list of parameters should be total petroleum hydrocarbons (TPH). Soil samples for TPH were collected and analyzed during the 2009-2010 RI activities.

Response: Samples will also be analyzed for TPH as requested by EPA and NJDEP.

25. Section 4.4.1.2, page 34 – EPA agrees with the proposal to place the "intermediate well" at a screen depth (somewhere) between 35-50 ft. below ground surface, as this is consistent with previous soil boring logs which have indicated contamination, odors, and PID readings.

Response: The EPA's comment is acknowledged.

26. *Figures 12 and 13, from the June 2011 Report, should be revised to depict "dashed" lines on the western and eastern extent of the benzene plume since there is a degree of uncertainty to its true lateral extent.*

Response: Future figures will utilize dashed lines where there is uncertainty regarding the groundwater data.

27. *Currently there is a lack of any Intermediate or Deep Wells between the 2 Foster Avenue building, 1 Foster Avenue building, and 5 Foster Avenue building and monitoring wells: MW-14 and MW-13R. A source may be revealed here. EPA is evaluating the need to install additional monitoring wells for these missing intervals.*

Response: The EPA comment is acknowledged.

SHERWIN-WILLIAMS RESPONSE TO ATTACHMENT III

The New Jersey Department of Environmental Protection (Department) has completed its review of the above referenced documents for the Sherwin Williams (SW) Sites in Gibbsboro, Camden County, NJ. These documents were submitted pursuant to CERCLA and the Technical Requirements for Site Remediation (TRSR) at N.J.A.C. 7:26E.

The Department's comments are provided below.

Response to USEPA and NJDEP October 13, 2011 Groundwater Comments for the March 1, 2011 Evaluation of Soil, Sediment, Surface Water and Groundwater Results and Proposal for Additional Site Characterization, and June 1, 2011 Work Plan for Additional Groundwater Characterization dated January 20, 2012

- 1. Specific Comments-June 2001 GWWP, Comment 1, 1st bullet, Page 22: The Department requested that an additional boring or potentially a shallow well be installed near the eastern corner of 3 U.S. Avenue (Former Building No. 55). SW responded that, "The Department's request for an additional shallow well along U.S. Avenue will be evaluated once the results of the shallow groundwater screening program are obtained." However, the Department finds that Figure 14 (revised) does not include a "geoprobe" boring in this area along U.S. Avenue. The Department reiterates that if there are no utilities or obstructions present, then the Department requests that an additional boring be included in the "EPA shallow groundwater screening program."*

Response: A shallow groundwater screening boring has been included in this location. See Figure 14 of the Updated Revised FMP Groundwater Work Plan.

Revised Workplan for Additional Groundwater Characterization, dated January 20, 2012

- 2. Section 4.0 Supplemental Groundwater Investigation Scope of Work, Shallow Groundwater, 2nd Bullet, Page 21: The document states, "Additional delineation of the pentachlorophenol found in MW-17 and MW-18 would be along the northwest bank of Hilliard Creek...no additional delineation of pentachlorophenol in groundwater is proposed." The Department, notes that additional delineation for pentachlorophenol upgradient of Tank Farm Area B may be warranted based on the results of the "EPA shallow groundwater screening program." The Department reserves the right to require additional delineation for pentachlorophenol.*

Response: The NJDEP's comment is noted.

3. *Section 4.0 Supplemental Groundwater Investigation Scope of Work, Deep Groundwater, 2nd Bullet, Page 22: The document states, "Metals and vinyl chloride (were) found in the sample from MW-30...The vinyl chloride is also delineated in MW-35." However, a review of the cross- sections indicates that MW-30 is screened in "unit 2" at 55 to 60 feet bgs and MW-35 is screened in "Unit 4" at 70 to 80ft. bgs, which are separated by "Unit 3". As such, the Department does not agree that vinyl chloride is delineated in MW-30, but is not requiring additional investigation beyond what is presented in this workplan at this time. However, the Department reserves the right to require additional delineation for vinyl chloride pending the results of the upcoming well installation groundwater sampling program.*

Response: The NJDEP's comment is noted.

4. *Section 4.1 Shallow Groundwater Screening Investigation, Soil Sampling Protocol (at shallow groundwater locations), 2nd Paragraph, Page 23: The document states, "...one sample will be provided to the laboratory for TCL VOCs, TCL SVOCs, and TOC analysis." SW shall revise the sentence to include laboratory analysis for EPH as referenced in previous paragraph.*

Response: As previously discussed with the EPA and NJDEP, the samples will be analyzed for TPH using NJDEP Method OQA-QAM-025-02/08.

5. *Section 4.2 Pilot Application of Innovative Site Characterization Technologies, Pages 24 and Figure 15: The document states, "As illustrated in the two flow charts, (Figure 15) all technologies will be tested and evaluated prior to full field implementation." However the Department finds no discussion on what specifically the pilot test entails for either direct sensing technology {(membrane interface probes (MIP) or ultraviolet/laser induced fluorescence (UVIF/LIF)} or how the technologies will be evaluated and followed through to "full field implementation." In addition, except for the statement above, there is no other reference to Figure 15 in this document. SW shall clarify what exactly will be done during the pilot test and/or full field implementation for each direct sensing technology to be evaluated including but not limited to: location where both the pilot test and full field implementation will be implemented, number of borings to be evaluated during pilot test and full field implementation, how the pilot test information will be evaluated to determine if full field implementation is warranted, etc. The Department recommends evaluating the use of these direct sensing technologies in at least two areas ("contaminated and uncontaminated") as a comparison to help determine if the technology provides data that is useful.*

Response: Sherwin-Williams has previously provided to the EPA and NJDEP more detailed information on the technologies, the types of subcontractor reports that will be received and the methodology by which the results will be evaluated. The ER and UVIF/LIF will be applied in areas where there is known contamination and in areas

where there is no known contamination. Figure 16 of the Updated Revised FMP Groundwater Work Plan presents the locations where the initial field testing of the technologies will be conducted.

6. *Section 4.2 Pilot Application of Innovative Site Characterization Technologies, MIP, Page 25, 1st bullet: The document states, "It is currently expected that this technology (MIP) will be used as the initial phase of the deep benzene source investigation." SW shall clarify if the pilot test for the MIP technology will be conducted at MW-30 as part of "the initial phase of the deep benzene investigation" or if the pilot test will be conducted at another location. If deemed useful by means of the pilot test, SW shall also clarify where else the MIP will be used across the site.*

Response: The MIP will be applied in the MW-30 area prior to conducting the proposed soil and groundwater benzene source investigation. If successful, the MIP investigation will provide information on the lithology and the vertical distribution of benzene. Based on the results of the MIP investigation, the depths at which soil samples will be collected may be modified from those presented in the Updated Revised FMP Groundwater Work Plan, or the depths at which wells will be screened may be adjusted. These decisions will be made in consultation with the EPA.

7. *Section 4.2 Pilot Application of Innovative Site Characterization Technologies, MIP, Page 25, 3rd bullet: The document states, "It is currently expected that UVIF/LIF will be applied in the Seep Area to provide additional information regarding the distribution of the LNAPL." SW shall clarify how many "borings will be evaluated using UVIF/LIF as part of the pilot test and during full field implementation. The Department requests clarification on the size and shape of the "Seep Area" where UVIF/LIF will be implemented as a pilot study and during "full field implementation." The Department notes that the "Red/Green Dot Map" (2003) indicates that product-impacted soils extend far beyond the area known as the Seep Area. SW shall clarify if UVIF/LIF technology will be used to evaluate all the "product-impacted soils outside of the Seep Area as during "full field implementation". At a minimum, the Department requests that the UVIF/LIF be implemented north of Foster Avenue or "upgradient" of the Seep Area.*

Response: Figure 16 showing the locations of the initial field pilot application of the technologies was previously provided to EPA and NJDEP, and is included as with the Updated Revised FMP Groundwater Work Plan. As stated previously, only a preliminary assessment of the extent of the full scale field application has been made at this time, since it is not currently known whether the technologies will be retained and applied on a full scale basis. Following the initial pilot applications and subsequent discussions with the EPA, and after a decision to retain one or more of the pilot technologies has been made, a work plan for a more wide-spread application of the retained technologies (if any) will be presented to the EPA.

8. *Section 4.2 Pilot Application of Innovative Site Characterization Technologies, Page 26: The document states, "The preliminary use of these technologies will be employed in the areas listed below, and providing accurate information, will be used at additional areas of the site for continual conceptual site model evaluations." SW shall clarify what "additional areas of the site" may be evaluated, as the document does not specify.*

Response: As stated above, no detailed evaluation of the scope of the full scale application of the technologies has been conducted. If it is determined that one or more technologies merit full scale application, a separate work plan will be submitted.

9. *Section 4.2.2 Deep Benzene Investigation (MW-30), Pages 26 and 27: The document states, "Use of direct sensing technologies (MIP/EC or UVIF/LIF/EC) will be the first step in the investigation of benzene in the vicinity of MW-30...The determination of which technology to employ will be evaluated following gamma ray logging results analysis." SW shall clarify how gamma ray logging will help decide which of the two direct sensing technologies will be selected for use in the MW-30 deep benzene investigation.*

Response: It has been concluded that the MIP technology will be used in the MW-30 area.

10. *Section 4.2.2 Deep Benzene Investigation (MW-30), Page 27: This document suggests for the initial phase of the deep benzene investigation at MW-30, either MIP/EC or UVIF/LIF will be used to assist in the subsequent selection of soil and groundwater samples for further analysis. However, the document fails to reference whether the "selected technology" will be used to further delineate contamination across the site. SW shall clarify if the selected direct sensing technology will be used to fully delineate benzene contamination across the site.*

Response: If the technology is found to be a useful tool, it will be considered for further application. The decision regarding whether, and to what extent, to further use one or more technologies will be made in consultation with the EPA.

11. *Section 4.2.3 Seep Area, Page 27: The document states, "Prior to field scale pilot testing activities, bench-scale studies will be conducted to evaluate the practicability of bulk resistivity signatures related to site materials." SW shall provide additional information on the implementation of the bench scale studies and sample collection methodologies for electrical resistivity (ER) investigation.*

Response: An SOP for the bench-scale ER was previously provided to EPA and the NJDEP and is attached as Appendix D to the Updated Revised FMP Groundwater Work Plan.

12. Section 4.2.3 Seep Area, Page 27: The document states, "...the UVIF/LIF and ER technologies will be applied and subsequently evaluated to determine if they will be useful in better defining the extent of LNAPL in the Seep Area." SW shall clarify where within the "Seep Area" UVIF/LIF will be implemented during the pilot test, and how many borings will be drilled as part of this study. SW must also provide additional information on the "full field implementation" of UVIF/LIF and ER technologies, if the pilot studies deem them useful. SW shall clarify if these technologies will be used in other areas where "product-impacted soils" are located as defined by the "Red/Green Dot Map" (2003).

Response: Figure 16 presenting the locations of the UVIF/LIF and MIP was previously provided to the EPA and NJDEP. The figure is included with the Updated Revised FMP Groundwater Work Plan.

13. Section 4.2.3 Seep Area, Page 28: The document states, "If LNAPL does display a specific resistivity signature within the site soils, then the next step would be to apply electrical resistivity in transects which cross previously predicted LNAPL plume boundaries." SW shall clarify where these transects will cross, as the "Red/Green Dot Map" (2003) suggests the product-impacted soils are extensive and are not confined to the Seep Area. SW shall clarify how electric resistivity will be implemented and what depth does it extent to into the subsurface. SW shall clarify if underground utilities/structures or buildings will interfere with the ER investigation.

Response: As stated previously, the scope of a full scale application of the ER technology has not been determined. If bench scale testing determines that ER is an effective tool, a field pilot study will be conducted, and the specifications of the study will be provided to the EPA. If this study is successful, then a plan for implementing the technology on a full scale basis will be developed and provided to the EPA for review.

14. Figure 15, Seep Area and MW-30 Area: SW shall provide a text description of the information presented in both figures.

Response: The figure will be revised as requested in future reports.

Technical Memorandum for Pilot Application of Innovative Site Characterization Technologies, dated March 21, 2012

15. The letter stated, "Sherwin Williams is requesting that EPA review this Technical Memorandum so that the field work implementation for the pilot application of the innovative technologies can be expedited." The Department assumed that the Technical Memorandum would provide clear discussion on the implementation of the "pilot test" for the various innovative technologies as well as a discussion on

what would occur during full field implementation as neither were included in the January 2012 Revised GW Workplan. The Department finds that the March 2012 Technical Memorandum provides no additional information as such as has no additional comments than what is referenced above.

Response: Additional information regarding the technical details of the technologies and the decision-making that will be conducted based on the results has subsequently been provided to the EPA and NJDEP for review. The Technical Memorandum was excerpted from the Revised Groundwater Work Plan and provided as a stand-alone document so that the EPA could review it independently from the work plan.

Additional Information presented during April 12, 2012 Conference Call

16. Figure 1, Proposed Innovative Technology Locations: Figure 1 (dated April 5, 2012) which was provided during the April 12, 2012 conference call, references the approximate areas where the pilot tests will be implemented. SW shall also provide a figure which indicates where the "full scale implementation" of the technologies will be conducted, if they are proven useful.

Response: As stated previously, the scope of the full scale application will be developed once Sherwin-Williams and EPA are in concurrence that the technologies will provide useful information.



SHERWIN-WILLIAMS

THE SHERWIN-WILLIAMS COMPANY
Environmental, Health & Regulatory Services
101 Prospect Avenue NW
Cleveland, Ohio 44115-1075
Facsimile: (216) 566-2730

Formatted: Line spacing: At least 12 pt,
Border: Bottom: (No border)

Formatted: Line spacing: At least 12 pt

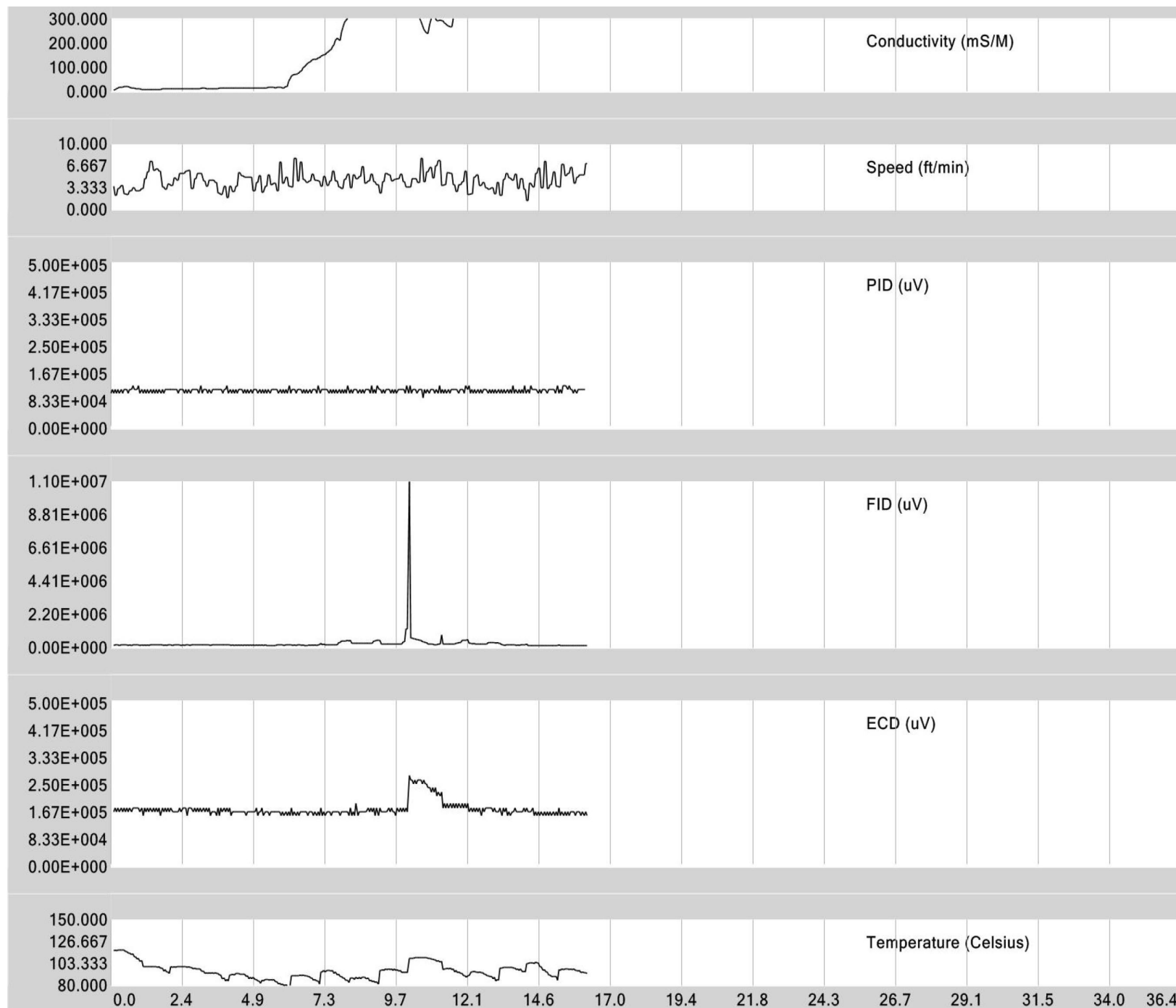
APPENDIX 1

Formatted: Font: Bold

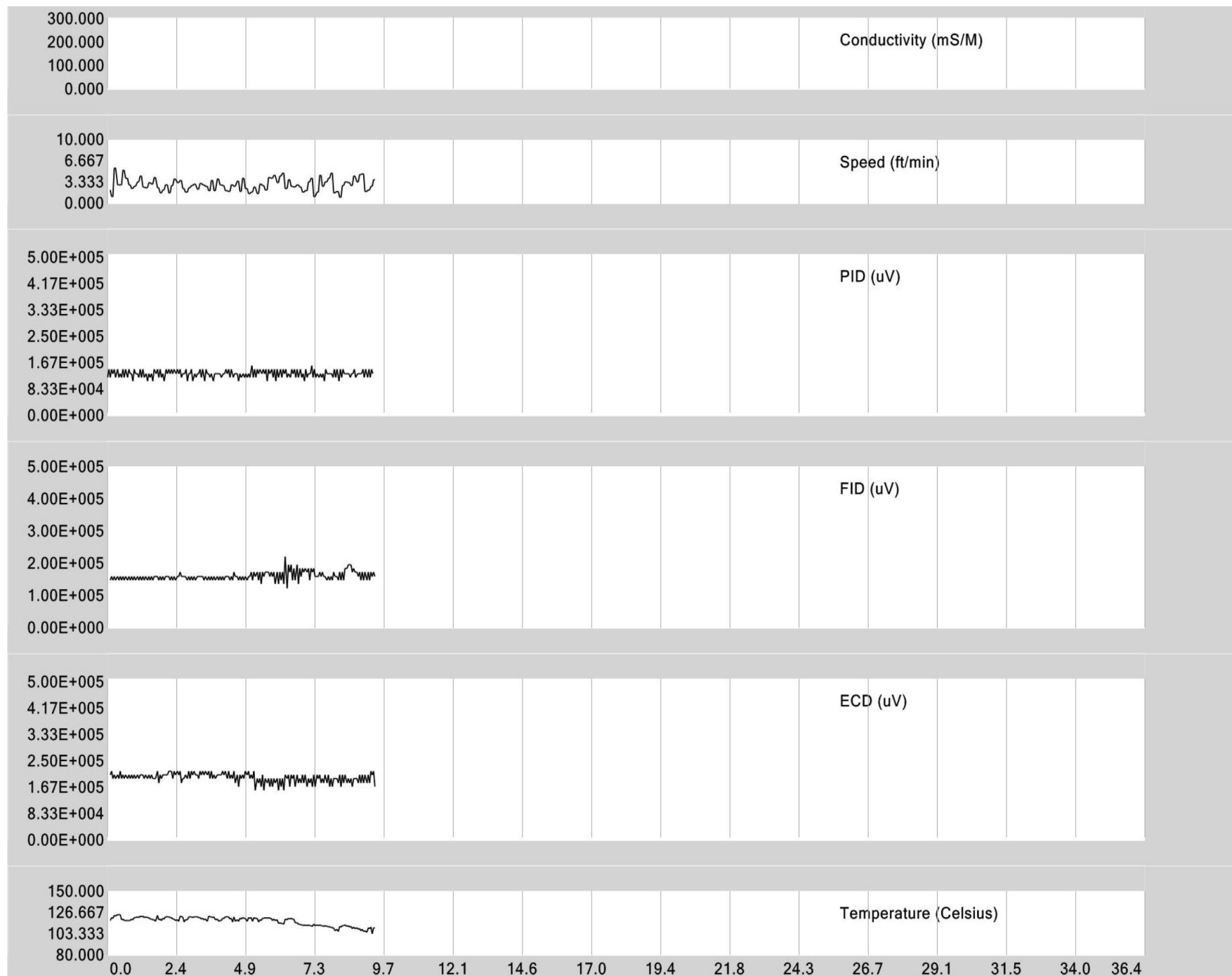
Formatted: Vertical Alignment: Center

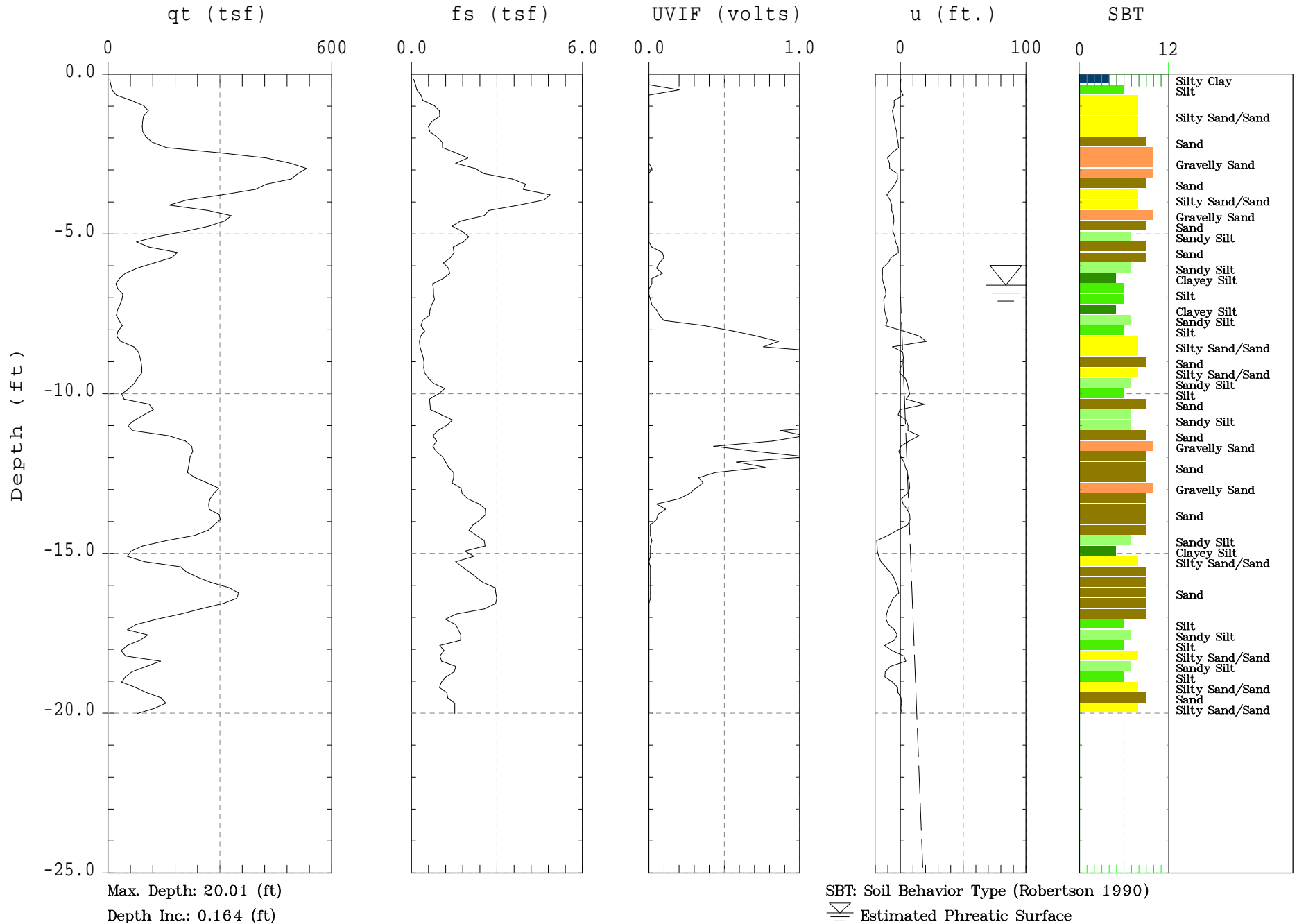
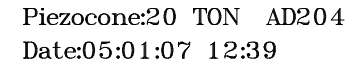
Formatted: Centered

MIP-17



CPT-06



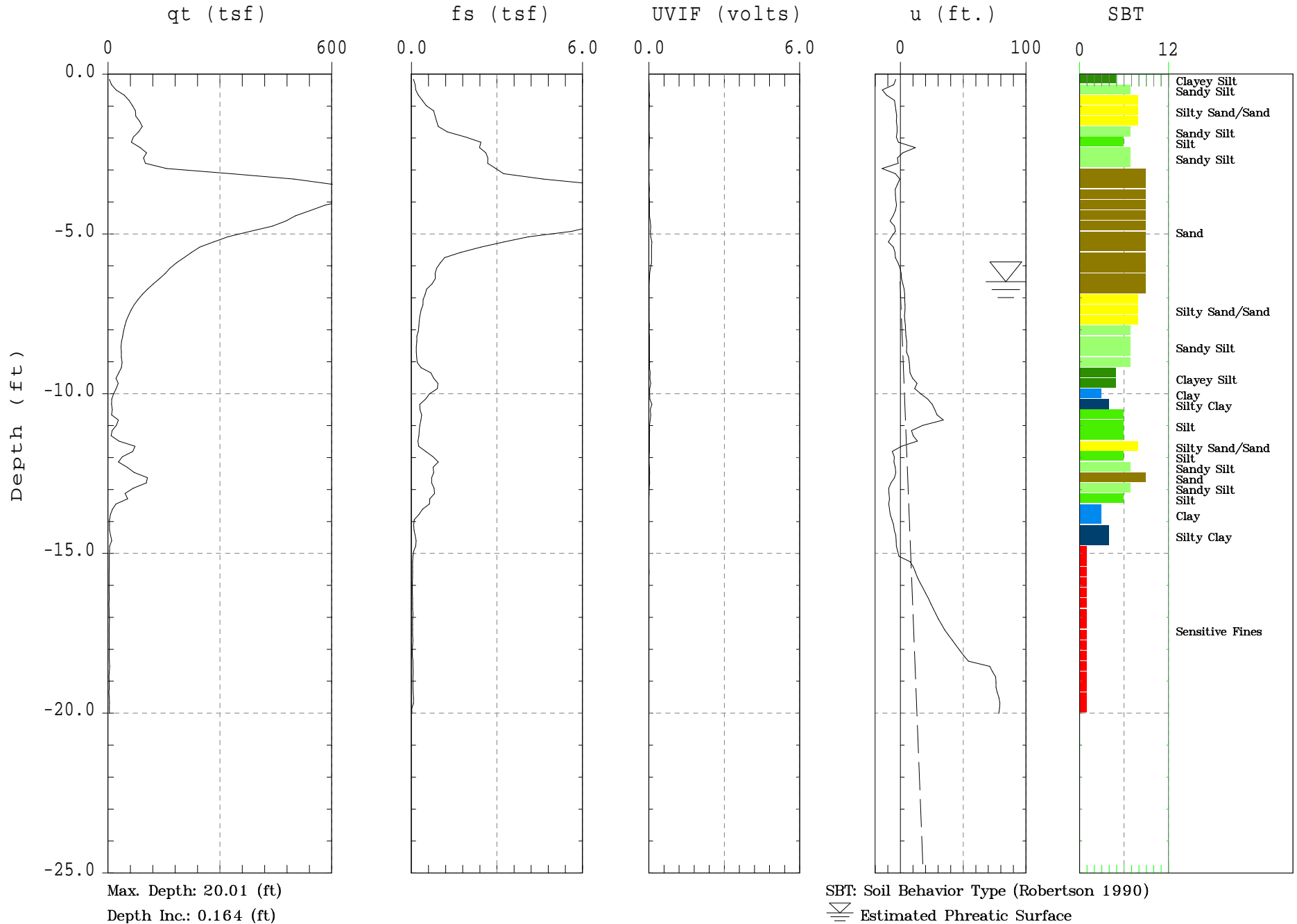




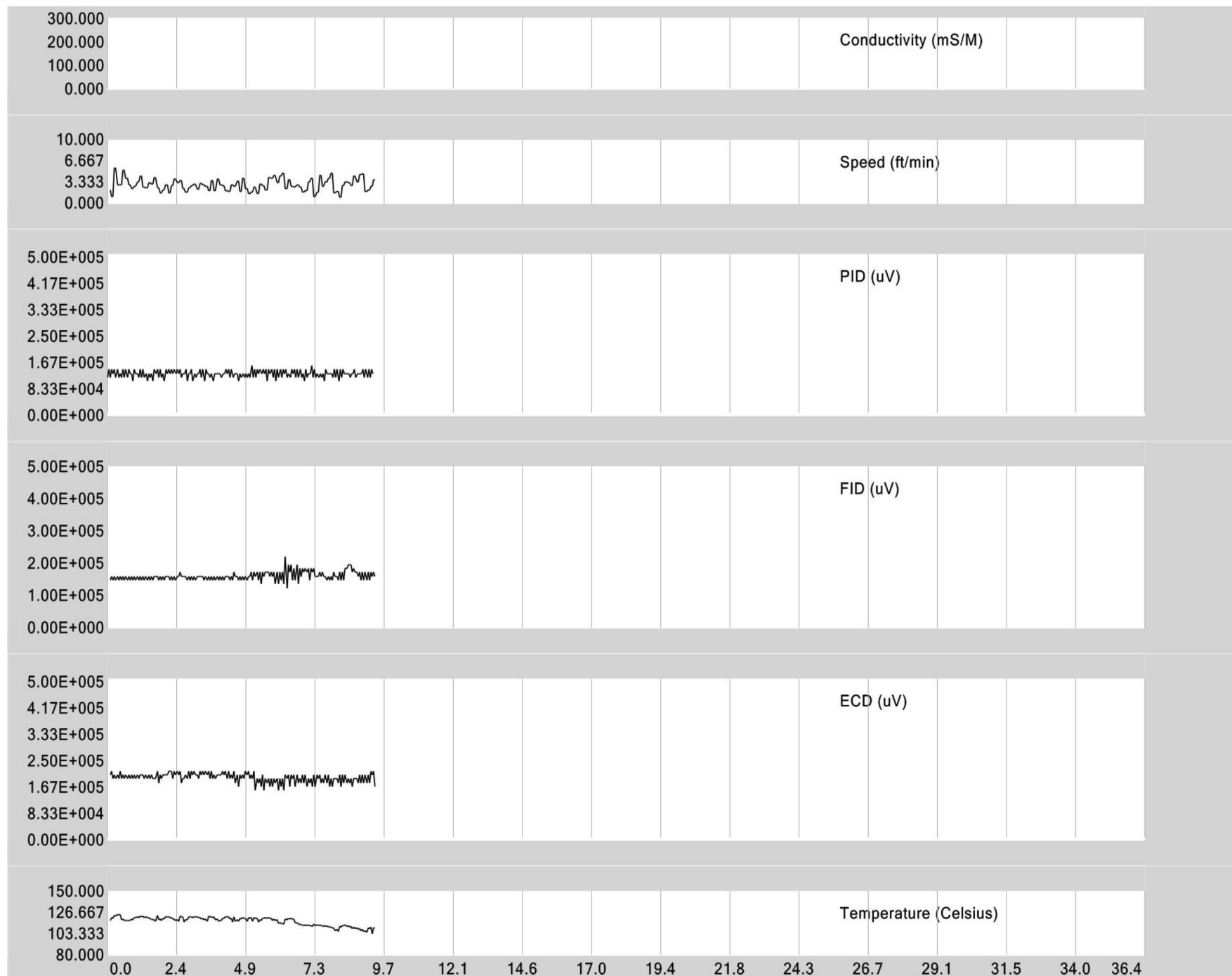
Lockheed Martin

Sounding: CPT-13
Site: Bridgeport, NJ

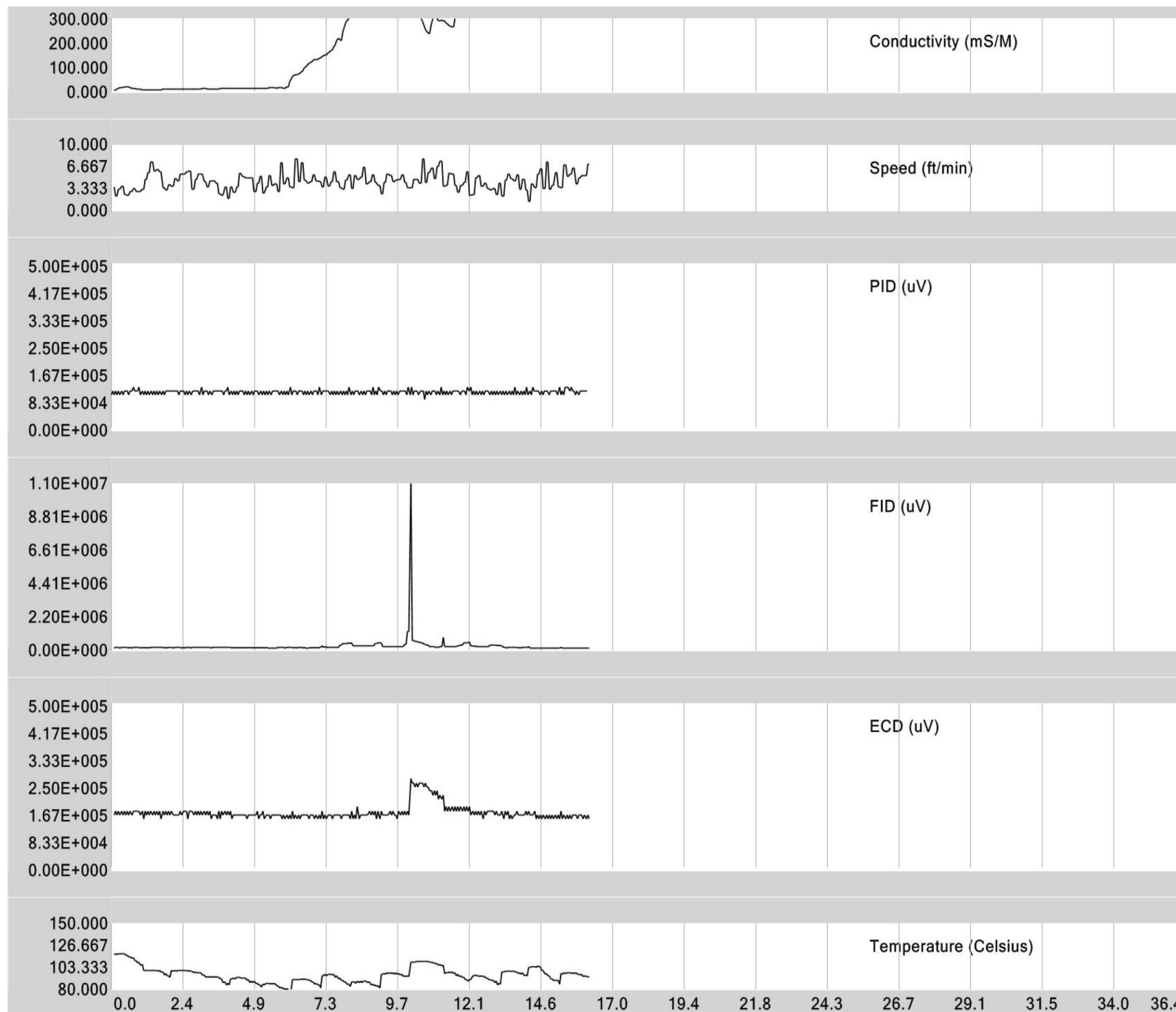
Piezocone: 20 TON AD204
Date: 05:02:07 13:29



CPT-06



MIP-17

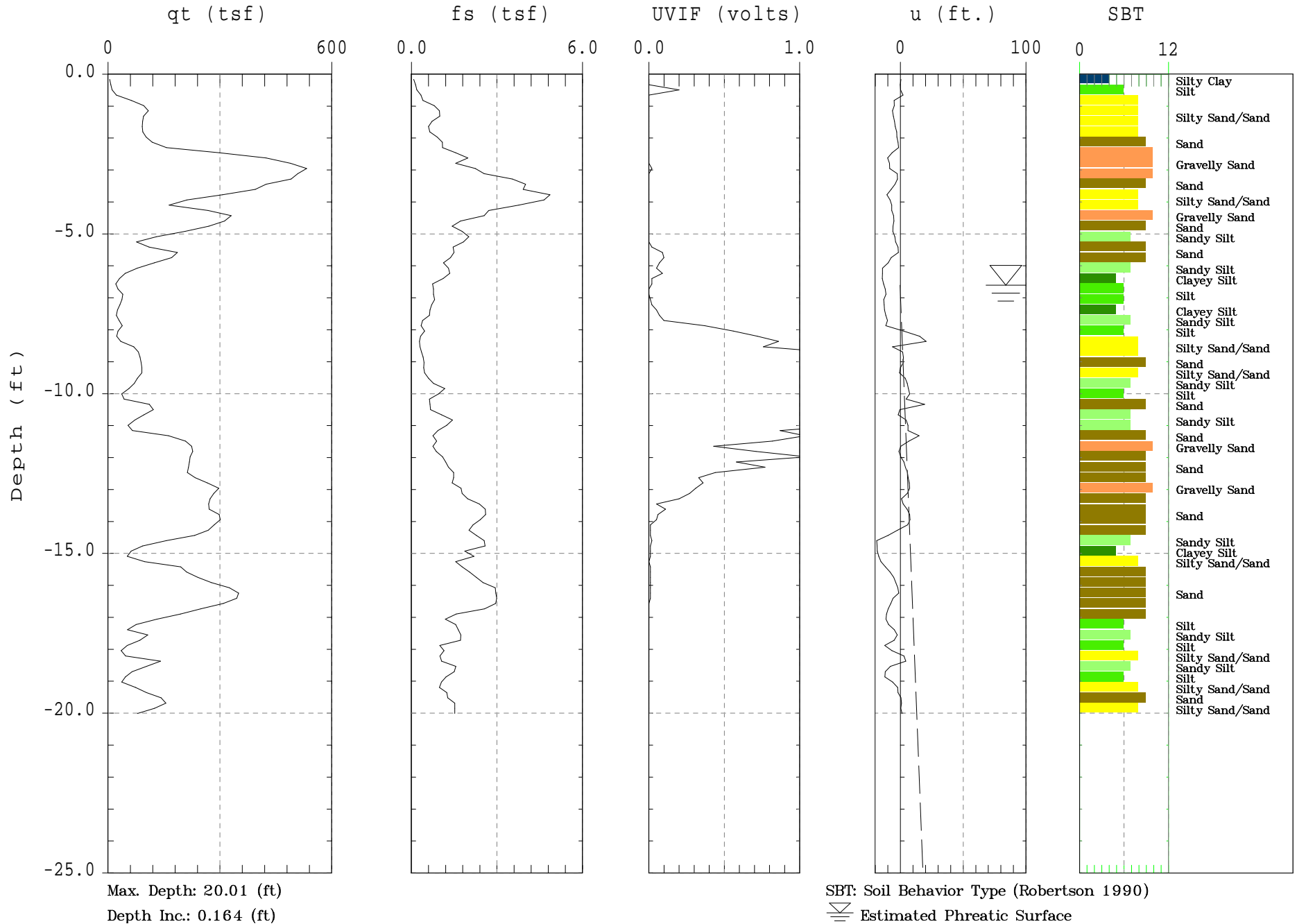




Lockheed Martin

Sounding: CPT-01
Site: Bridgeport, NJ

Piezocone: 20 TON AD204
Date: 05:01:07 12:39

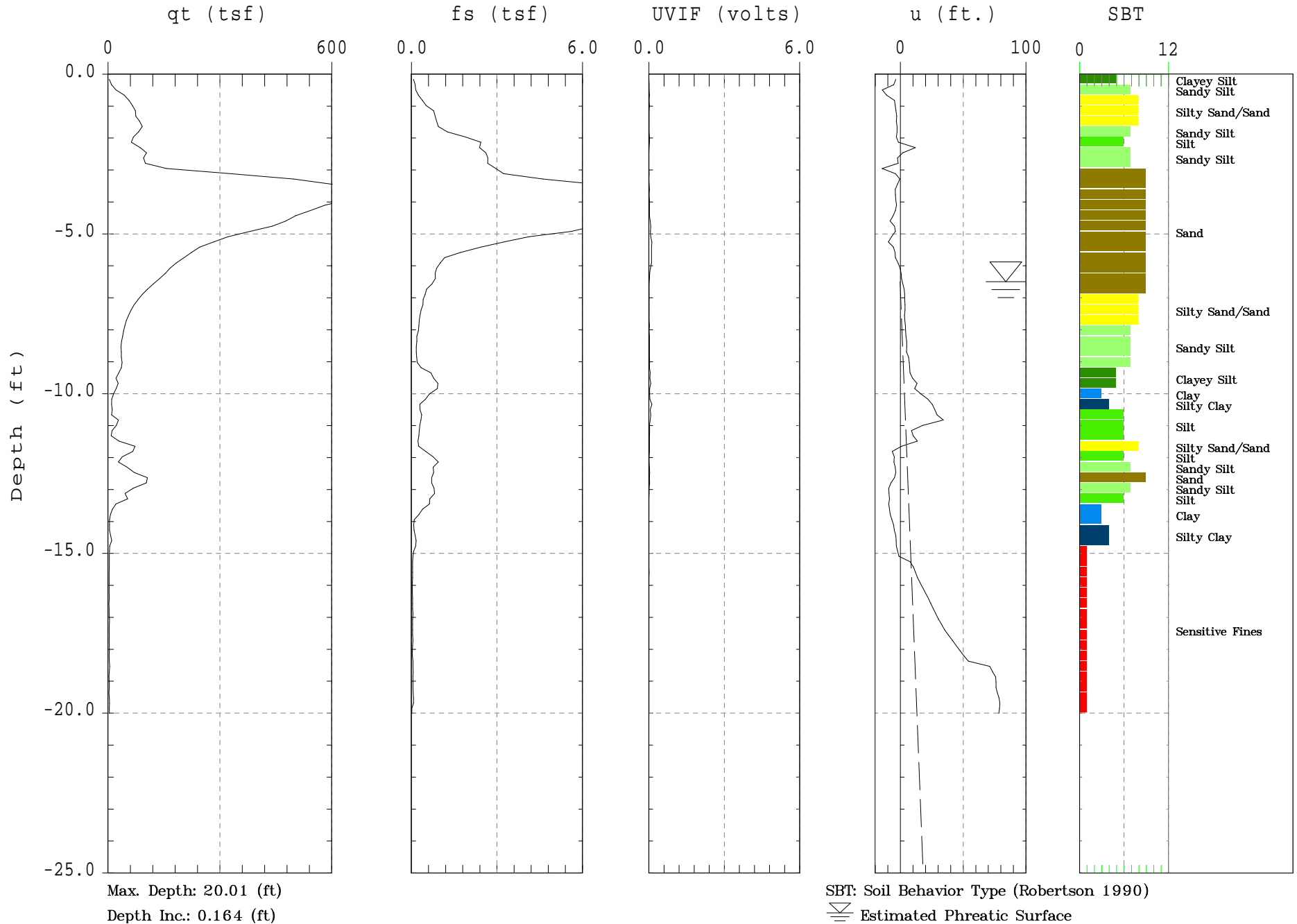




Lockheed Martin

Sounding: CPT-13
Site: Bridgeport, NJ

Piezocone: 20 TON AD204
Date: 05:02:07 13:29



APPENDIX 2

Formatted: Font: Bold

SERIAL # 006527

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
TRENTON, NJ

3154970
3154971

Permit No.

MONITORING WELL PERMIT

VALID ONLY AFTER APPROVAL BY THE D.E.P.

COORD #:

31.13.577

Owner The Sherwin-Williams Company, Inc.

Driller JCA Associates, Inc.

Address 101 Prospect Ave. NW

Address 1256 N. Church Street

Cleveland OH 44115-1075

Moorestown, NJ 08057

Name of Facility The Paintworks Corporate Center

Diameter of Well(s) 4 Inches Proposed Depth of Well(s) 80 Feet

Address 20 E. Clementon Rd

of Wells Applied for (max. 10) 2 Will pumping equipment be installed? YES ☐ NO ☒

Gibbsboro NJ 08026

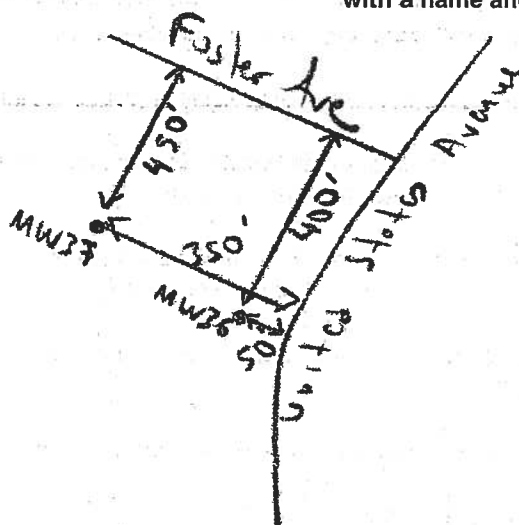
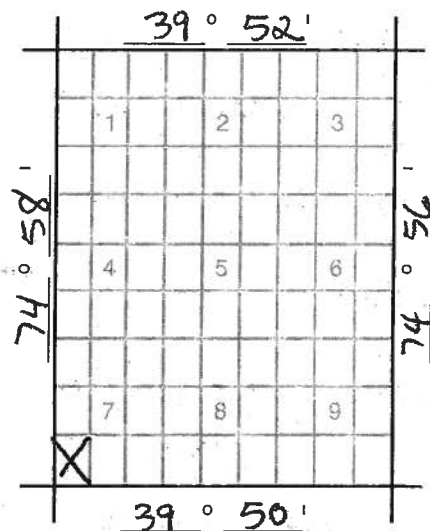
Type of Well (see reverse) Monitoring If Yes, give pump capacity cumulative GPM

LOCATION OF WELL(S)

| | | | |
|-----------------|----------------------|-------------------------------|----------------------|
| Lot # <u>01</u> | Block # <u>17.01</u> | Municipality <u>Gibbsboro</u> | County <u>Camden</u> |
|-----------------|----------------------|-------------------------------|----------------------|

Draw sketch of well(s) nearest roads, buildings, etc. with marked distances in feet. Each well MUST be labeled with a name and/or number on the sketch.

State Atlas Map No. 31



N ↑

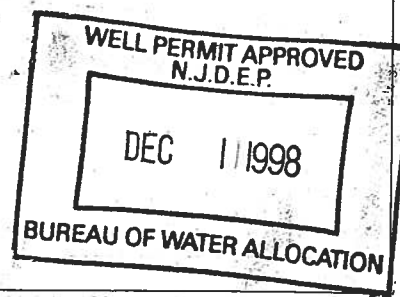
FOR MONITORING WELLS, RECOVERY WELLS, OR PIEZOMETERS, THE FOLLOWING MUST BE COMPLETED BY THE APPLICANT. PLEASE INDICATE WHY THE WELLS ARE BEING INSTALLED:

- ☐ Spill Site
- ☐ ISRA Site
- ☐ CERCLA (Superfund) Site
- ☐ RCRA Site
- ☐ Underground Storage Tank Site
- ☐ Operational Ground Water Permit Site
- ☐ Pretreatment and Residuals Site
- ☐ Water and Hazardous Waste Enforcement Case
- ☐ Water Supply Aquifer Test Observation Well

CASE I.D. Number

☒ Other (explain) Administrative Consent Order dated 20 September 1990

This Space for Approval Stamp



- FOR D.E.P. USE
- ☐ Issuance of this permit is subject to the conditions attached. (see next page)
 - ☒ For monitoring purposes only
 - ☐ The well(s) may not be completed with more than 25 feet of total screen or uncased borehole.

SEE REVERSE SIDE FOR IMPORTANT PROVISIONS AND REGULATIONS PERTAINING TO THIS PERMIT.

In compliance with N.J.S.A. 58:4A-14, application is made for a permit to drill a well as described above.

Date November 25, 1998

Signature of Driller Jim Duffy

Registration No. 11224

Signature of Owner Gordon Kuntz

MONITORING WELL RECORD

Well Permit No. 31 54971

Atlas Sheet Coordinates 31 13 577

OWNER IDENTIFICATION - Owner SHERWIN WILLIAMS CO. INC.

Address 101 PROSPECT AVE., N.W

City CLEVELAND

State OH

Zip Code _____

WELL LOCATION - If not the same as owner please give address. Owner's Well No. MW-37

County CAMDEN

Municipality GIBBSBORO BORO

Lot No. 01

Block No. 19-01

Address 20 EAST CLEMENTON RD.

DATE WELL STARTED 12/21/98

DATE WELL COMPLETED 12/23/99

TYPE OF WELL (as per Well Permit Categories) MONITORING

Regulatory Program Requiring Well WATER/HAZ ENF

Case I.D.# _____

CONSULTING FIRM/FIELD SUPERVISOR (if applicable) _____

Tele. # _____

WELL CONSTRUCTION

Total depth drilled 69 ft.

Well finished to 68 ft.

Borehole diameter:

Top 12 in.

Bottom 8 in.

Well was finished: ☒ above grade
☐ flush mounted

If finished above grade, casing height (stick up) above land surface 2.3 ft.

Was steel protective casing installed?

☒ Yes ☐ No

Static water level after drilling 5.40 ft.

Water level was measured using M-Scope

Well was developed for 1 hours
at 10 gpm

Method of development Pumping

Was permanent pumping equipment installed? ☐ Yes ☒ No

Pump capacity _____ gpm

Pump type: _____

Drilling Fluid Bentonite Type of Rig Feeling F-7

Health and Safety Plan submitted? ☒ Yes ☐ No

Level of Protection used on site (circle one) None D C B A

I certify that I have constructed the above referenced well in accordance with all well permit requirements and applicable

State rules and regulations.

JAMES C. ANDERSON ASSOC. INC.

Drilling Company _____

Well Driller (Print) Jon R. Urban

Driller's Signature Jon R. Urban

Registration No. M1386

Date 2/2/99

| Note: Measure all depths from land surface | Depth to Top (ft.) | Depth to Bottom (ft.) | Diameter (inches) | Material | Wgt./Rating (lbs/sch no.) |
|---|--------------------|-----------------------|-------------------|------------------------------|---------------------------|
| Single/Inner Casing | <u>+2.3</u> | <u>58</u> | <u>4</u> | <u>PVC</u> | <u>Sch 40</u> |
| Middle Casing (for triple cased wells only) | | | | | |
| Outer Casing (largest diameter) | <u>0</u> | <u>51</u> | <u>8</u> | <u>Carbon</u> | <u>Sch 40</u> |
| Open Hole or Screen (No. Used <u>010</u>) | <u>58</u> | <u>68</u> | <u>4</u> | <u>PVC</u> | <u>Sch 40</u> |
| Blank Casings (No. Used) | | | | | |
| Tail Piece | | | | | |
| Gravel Pack | <u>55</u> | <u>69</u> | | <u>#0</u> | |
| Grout | <u>0/0</u> | <u>55/51</u> | | <u>Neat Cement Bentonite</u> | <u>2773 lbs. 148 lbs.</u> |

Grouting Method Tremie

Drilling Method Mud Rotary

GEOLOGIC LOG

Note each depth where water was encountered in consolidated formations.

0-44' Tan, Lt. Brown Sand

44'-62' DK. Gray Sandy silt

62'-69' DK. Green glauconitic sandy silt

Borehole Location Data**Roy F. WESTON, Inc.**

BOREHOLE ID : MW-37 PROJECT NAME: SHERWIN WILLIAMS PHASE 5
BEGIN DATE : 12/21/98 END DATE : 12/23/98

LOGGER/COMPANY : . WESTON, INC

BOREHOLE COMPLETED IN (<O>verburden edrock) : 0

TOTAL DEPTH : 79.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 12.25
INTERVAL: 0.00 ft. to 50.00 ft. BGS
METHOD : DIRECT ROTARY FLUID : MUD
BOREHOLE DIAMETER #2: 8.00
INTERVAL: 0.00 ft. to 79.00 ft. BGS
METHOD : DIRECT ROTARY FLUID : MUD
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : JCA
DRILLER : JOHN URBAN
DRILL RIG TYPE : FAILING F-7

| | ESTIMATED | SURVEYED |
|------------------------|-----------|-------------|
| SURFACE ELEVATION : | 0.000 | 85.130 |
| N. COORDINATE : | 0.0000 | 365203.6870 |
| E. COORDINATE : | 0.0000 | 361459.7070 |

WELL PERMIT.....(Y)es (N)o: Y PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N

WELL INSTALLED...(Y)es (N)o: Y

WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0

WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0

| PUMPS INSTALLED..(Y)es (N)o: N | TYPE | DEPTH |
|--------------------------------|----------|-------|
| | PURGE : | 0.00 |
| | SAMPLE : | 0.00 |

BOREHOLE TESTING

BOREHOLE GEOPHYSICS.....(Y)es (N)o: N

SLUG TESTS.....(Y)es (N)o: N

PACKER TESTS.....(Y)es (N)o: N

PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :

on Summary

Roy F. WESTON, Inc.

NAME SHERWIN WILLIAMS PHASE 5
PAINT WORKS SITE

DRILLING FIRM JCA
INSPECTOR ERNIE SALAZAR

WELL ID MW-37
START DATE 12/21/98
COMPLETION DATE 12/23/98

WATER LEVELS

| DEPTH | | | ELEV. | | | DRILLING SUMMARY | |
|---|----|--|--------|--|--|------------------|-----------------------|
| 0.00 | TC | | 0.00 | | | Driller | JOHN URBAN |
| 0.00 | GS | | 0.00 | | | Drilling Fluid | MUD |
| | | | | | | Well Type | DOUBLE CASED SCREENED |
| WELL DESIGN CONSTRUCTION | | | | | | | |
| <p>Casing #1 Diameter: 4.00 inch Interval: 0.00 to 68.00 ft. Type : PVC SCH 40</p> <p>Casing #2 Diameter: 8.00 inch Interval: 0.00 to 50.00 ft. Type : LOW CARBON</p> <p>Stick Up Inner Casing: 0.00 ft. Outer Casing: 2.50 ft.</p> <p>Casing Grout: CEMENT/BENT Interval: 0.00 to 52.00 ft.</p> <p>Seal Type: BENTONITE Interval: 52.00 to 54.00 ft.</p> <p>Sand Pack Type: MORIE #0 Interval: 54.00 to 69.00 ft. Grain Size: Median Diameter: Screen Diameter: 4.00 Interval: 58.00 to 68.00 ft. Type : PVC Slots: 0.010 inches</p> <p>Silt Trap Interval: 0.00 to 0.00 ft. Backfill Type: Interval: 0.00 to 0.00 ft. Top of Bedrock:</p> | | | | | | | |
| 50.00 | OC | | -50.00 | | | | |
| 52.00 | BN | | -52.00 | | | | |
| 54.00 | SP | | -54.00 | | | | |
| 58.00 | SC | | -58.00 | | | | |
| WELL DEVELOPMENT | | | | | | | |
| <p>Date: 12/28/98 Method: Overpumping. Yield: 10 gpm</p> <p>Purged Volume: 450 gal</p> | | | | | | | |
| COMMENTS | | | | | | | |
| <p>TC = Top of Casing SP = Top Sand Pack = Grout GS = Ground Surface SC = Top Screen = Seal BN = Top Seal BS = Bottom Screen = Sand Pack OC = Outer Casing TD = Total Depth = Formation</p> | | | | | | | |
| 68.00 | BS | | -68.00 | | | | |
| 69.00 | TD | | -69.00 | | | | |
| Additional Comments: Morie #00 sand was used in interval 54' to 56'. | | | | | | | |

NOTE: Well Diagram not to Scale

Elevations are feet above mean sea level



205 Campus Drive
Edison, NJ 08837
Phone: (732) 417-5800
Fax: (732) 417-5801

Log of Borehole: MW-37

Project: Gibbsboro - Paintworks

Client: Sherwin-Williams

Driller: JCA - John Urban

Well Permit #:

Geologist/Logger: Ernie Salazar

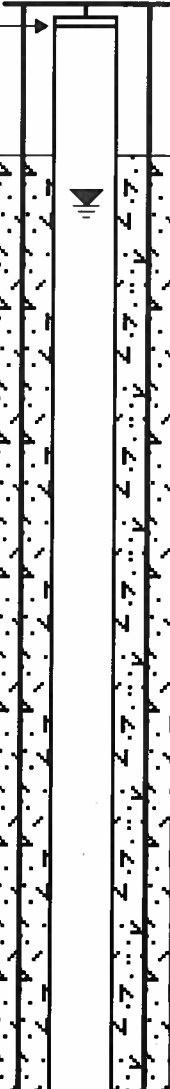

Drilling Method: Mud Rotary Drilling **NAD 1983 Coordinates**

Date Started: 12/21/98

Easting: 361459.707

Date Completed: 12/23/98

Northing: 365203.687

| SUBSURFACE PROFILE | | | | | SAMPLE | | | Comments | | |
|------------------------|-------------------|---|---|-----------|--|-------------|------------|----------|--|--|
| Elevation (ft amsl) | Depth (ft bgs) | Soil Profile | Description | USCS-ASTM | Well Construction | % Recovery | Blow Count | | Soil Column PID (ppm) | |
| | -3 | | Survey TIC = 85.13' amsl | |  | | | | NOTES: DATA COMPILED FROM ORIGINAL "GEOLIS" LOGS TO INCLUDE ELEVATION (ft-amsl) DATA. Soil is stained and has a petroleum-like odor. | |
| | -2 | | TIC = 2.10' above ground (measured in the field) | | | | | | | |
| | -1 | | | | | | | | | |
| 83.0 | 0 | | Ground Surface | | | | | | | |
| 81.0 | 1 |  | Brown silty sand. Moist, firm. | SM | | 80 | 6-6-10-11 | No Data | | |
| | 2 | | Orange-grey silty sand. Moist, firm. | | | 55 | 11-6-6-5 | | | |
| | 3 | | | | | 45 | 7-8-8-9 | | | |
| 4 | 40 | | | | | 6-7-9-9 | | | | |
| 76.0 | 5 | | 35 | | | 4-5-5-3 | | | | |
| 75.0 | 6 | | 50 | | | 3-4-4-3 | | | | |
| | 7 | Black-green silty sand. Moist, firm. | | | | | | | | |
| 73.0 | 8 | Black-green silty sand. Moist, firm. | | | | | | | | |
| | 9 | Black-green silty sand. Wet, loose. | | | | | | | | |
| 71.0 | 10 | | | | | | | | | |
| | 11 | Dark-grey poorly graded sand with silt. Wet, firm. | SP-SM | 80 | | | | | | |
| | 12 | | | | | | | | | |
| | 13 | | | 35 | | 10-12-13-11 | | | | |
| | 14 | | | | | | | | | |
| | 15 | | | | | | | | | |

WELL DESIGN CONSTRUCTION:

Outer Casing Diameter / Type: 8" Steel

Inner Casing Diameter / Type: 4" PVC

Screen / Slot Size: PVC 10 slot

Casing Grout Type: Cement/Bentonite

Seal Type: Bentonite

Sand Pack Type 1: Morie # 00

Sand Pack Type 2: Morie # 0

IC-Interval: bgs

SC-Interval: 58.0' - 68.0' bgs

GT-Interval: 0.0' - 52.0' bgs

ST-Interval: 52.0 - 54.0' bgs

SP1-Interval: 54.0' - 56.0' bgs

SP2-Interval: 56.0' - 69.0' bgs

Outer Casing Elevation (amsl): 83.03

Inner Casing Elevation (amsl): 83.03

Ground Elevation (amsl): NA

Elevation Datum: NAVD 1988

WELL DEVELOPMENT:

Date: 12/28/98

Initial Depth to Water: NA

Pumping Rate: 10 gpm

Method: Overpumping

Final Water Turbidity: NA

Purged Volume: 450 gal



205 Campus Drive
Edison, NJ 08837
Phone: (732) 417-5800
Fax: (732) 417-5801

Log of Borehole: MW-37

Project: Gibbsboro - Paintworks

Client: Sherwin-Williams

Driller: JCA - John Urban

Well Permit #:

Geologist/Logger: Ernie Salazar

Drilling Method: Mud Rotary Drilling **NAD 1983 Coordinates**

Date Started: 12/21/98

Easting: 361459.707

Date Completed: 12/23/98

Northing: 365203.687

| SUBSURFACE PROFILE | | | | Well Construction | SAMPLE | | | Comments |
|---------------------|----------------|--------------|--|-------------------|------------|-------------|-----------------------|--|
| Elevation (ft amsl) | Depth (ft bgs) | Soil Profile | Description | | % Recovery | Blow Count | Soil Column PID (ppm) | |
| 67.0 | 16 | | Dark-grey poorly graded sand. Wet, firm. | SP | 50 | 4-7-8-12 | No Data | Soil is stained and has a petroleum-like odor. |
| 65.0 | 18 | | Dark grey silty sand. Wet, firm. | SM | 55 | 8-10-12-15 | | |
| | 20 | | | | 40 | 9-12-14-17 | | |
| 61.0 | 22 | | Dark-grey poorly graded sand. Wet, firm. | SP | 30 | 10-11-12-16 | | Soil is stained and has a petroleum-like odor. |
| 59.0 | 24 | | Dark grey silty sand. Wet, loose. | | 90 | 3-4-4-8 | | Soil is stained and has a petroleum-like odor. |
| 57.0 | 26 | | Dark grey silty sand. Wet, firm. | SM | 35 | 8-9-10-12 | | Soil is stained and has a petroleum-like odor. |
| | 28 | | | | 100 | 6-7-6-11 | | |
| | 30 | | | | 65 | 6-6-7-9 | | |
| 51.0 | 32 | | Dark grey silty sand. Wet, loose. | | 90 | 3-4-4-4 | | |

WELL DESIGN CONSTRUCTION:

Outer Casing Diameter / Type: 8" Steel

Inner Casing Diameter / Type: 4" PVC

Screen / Slot Size: PVC 10 slot

Casing Grout Type: Cement/Bentonite

Seal Type: Bentonite

Sand Pack Type 1: Morie # 00

Sand Pack Type 2: Morie # 0

IC-Interval: bgs

SC-Interval: 58.0' - 68.0' bgs

GT-Interval: 0.0' - 52.0' bgs

ST-Interval: 52.0 - 54.0' bgs

SP1-Interval: 54.0' - 56.0' bgs

SP2-Interval: 56.0' - 69.0' bgs

Outer Casing Elevation (amsl): 83.03

Inner Casing Elevation (amsl): 83.03

Ground Elevation (amsl): NA

Elevation Datum: NAVD 1988

WELL DEVELOPMENT:

Date: 12/28/98

Method: Overpumping

Initial Depth to Water: NA

Final Water Turbidity: NA

Pumping Rate: 10 gpm

Purged Volume: 450 gal



205 Campus Drive
Edison, NJ 08837
Phone: (732) 417-5800
Fax: (732) 417-5801

Log of Borehole: MW-37

Project: Gibbsboro - Paintworks

Client: Sherwin-Williams

Driller: JCA - John Urban

Well Permit #:

Geologist/Logger: Ernie Salazar

Drilling Method: Mud Rotary Drilling **NAD 1983 Coordinates**

Date Started: 12/21/98

Easting: 361459.707

Date Completed: 12/23/98

Northing: 365203.687

| SUBSURFACE PROFILE | | | | Well Construction | SAMPLE | | | Comments |
|---------------------|----------------|--------------|---------------------------------------|-------------------|------------|-------------|-----------------------|--------------|
| Elevation (ft amsl) | Depth (ft bgs) | Soil Profile | Description | | % Recovery | Blow Count | Soil Column PID (ppm) | |
| 49.0 | 34 | | Dark grey silty sand. Wet, firm. | SM | 70 | 12-10-9-13 | No Data | Glauconitic. |
| 47.0 | 35 | | | | | | | |
| | 36 | | Grey-orange silty sand. Wet, firm. | ML | 30 | 5-7-8-8 | | |
| 45.0 | 37 | | | | | | | |
| | 38 | | Orange-grey silt. Wet, firm. | SM | 55 | 10-14-18-20 | | |
| 43.0 | 39 | | | | | | | |
| | 40 | | Orange-brown silty sand. Wet, firm. | SM | | 4-5-6-6 | | |
| | 41 | | | | | | | |
| | 42 | | | SM | | 6-7-9-7 | | |
| | 43 | | | | | | | |
| 39.0 | 44 | | Orange-brown silty sand. Moist, firm. | SM | 60 | 7-11-12-15 | | |
| | 45 | | | | | | | |
| 37.0 | 46 | | Black-green silty sand. Moist, firm. | SM | | 9-10-8-30 | | |
| | 47 | | | | | | | |
| 35.0 | 48 | | Drill through. Interval not sampled. | SM | | | | |
| | 49 | | | | | | | |
| | 50 | | | SM | | | | |
| 32.0 | 51 | | | | | | | |

WELL DESIGN CONSTRUCTION:

Outer Casing Diameter / Type: 8" Steel

Inner Casing Diameter / Type: 4" PVC

Screen / Slot Size: PVC 10 slot

Casing Grout Type: Cement/Bentonite

Seal Type: Bentonite

Sand Pack Type 1: Morie # 00

Sand Pack Type 2: Morie # 0

IC-Interval: bgs

SC-Interval: 58.0' - 68.0' bgs

GT-Interval: 0.0' - 52.0' bgs

ST-Interval: 52.0 - 54.0' bgs

SP1-Interval: 54.0' - 56.0' bgs

SP2-Interval: 56.0' - 69.0' bgs

Outer Casing Elevation (amsl): 83.03

Inner Casing Elevation (amsl): 83.03

Ground Elevation (amsl): NA

Elevation Datum: NAVD 1988

WELL DEVELOPMENT:

Date: 12/28/98

Initial Depth to Water: NA

Pumping Rate: 10 gpm

Method: Overpumping

Final Water Turbidity: NA

Purged Volume: 450 gal

205 Campus Drive
Edison, NJ 08837
Phone: (732) 417-5800
Fax: (732) 417-5801

Log of Borehole: MW-37

Project: Gibbsboro - Paintworks

Client: Sherwin-Williams

Driller: JCA - John Urban

Well Permit #:

Geologist/Logger: Ernie Salazar

Drilling Method: Mud Rotary Drilling **NAD 1983 Coordinates**

Date Started: 12/21/98

Easting: 361459.707

Date Completed: 12/23/98

Northing: 365203.687

| SUBSURFACE PROFILE | | | | | Well Construction | SAMPLE | | | Comments |
|------------------------|-------------------|--------------|--------------------------------------|-----------|-------------------|-------------|------------|-----------------------------|----------|
| Elevation (ft amsl) | Depth (ft bgs) | Soil Profile | Description | USCS-ASTM | | % Recovery | Blow Count | Soil Column PID (ppm) | |
| 27.0 | 52 | | Drill through. Interval not sampled. | | | | | | No Data |
| | 53 | | | | | | | | |
| | 54 | | | | | | | | |
| | 55 | | | | | | | | |
| | 56 | | | | | | | | |
| 23.0 | 57 | | Grey silty sand. Wet, firm. | SM | 75 | 9-10-18-34 | | | |
| | 58 | | | | | | | | |
| | 59 | | | | 85 | 12-14-16-20 | | | |
| 21.0 | 60 | | Grey silty sand. Wet, very dense. | | 87 | 56-100-0-0 | | | |
| | 61 | | | | | | | | |
| 19.0 | 62 | | No sample recovered. | | | | | | |
| | 63 | | | | | 56-25-27-31 | | | |
| 17.0 | 64 | | Gray silty sand. Wet, very dense. | SM | 71 | 41-100-0-0 | | | |
| | 65 | | | | | | | | |
| 15.0 | 66 | | No sample recovered. | | | | | | |
| | 67 | | | | | 100-0-0-0 | | | |
| 14.0 | 68 | | Grey-green silty sand. Wet, dense. | SM | 85 | 18-27-41-45 | | | |
| | 69 | | | | | | | | |

WELL DESIGN CONSTRUCTION:

Outer Casing Diameter / Type: 8" Steel

Inner Casing Diameter / Type: 4" PVC

Screen / Slot Size: PVC 10 slot

Casing Grout Type: Cement/Bentonite

Seal Type: Bentonite

Sand Pack Type 1: Morie # 00

Sand Pack Type 2: Morie # 0

IC-Interval: bgs

SC-Interval: 58.0' - 68.0' bgs

GT-Interval: 0.0' - 52.0' bgs

ST-Interval: 52.0 - 54.0' bgs

SP1-Interval: 54.0' - 56.0' bgs

SP2-Interval: 56.0' - 69.0' bgs

Outer Casing Elevation (amsl): 83.03

Inner Casing Elevation (amsl): 83.03

Ground Elevation (amsl): NA

Elevation Datum: NAVD 1988

WELL DEVELOPMENT:

Date: 12/28/98

Initial Depth to Water: NA

Pumping Rate: 10 gpm

Method: Overpumping

Final Water Turbidity: NA

Purged Volume: 450 gal



205 Campus Drive
Edison, NJ 08837
Phone: (732) 417-5800
Fax: (732) 417-5801

Log of Borehole: MW-37

Project: Gibbsboro - Paintworks

Client: Sherwin-Williams

Driller: JCA - John Urban

Well Permit #:

Geologist/Logger: Ernie Salazar

Drilling Method: Mud Rotary Drilling **NAD 1983 Coordinates**

Date Started: 12/21/98

Easting: 361459.707

Date Completed: 12/23/98

Northing: 365203.687

| SUBSURFACE PROFILE | | | | Well Construction | SAMPLE | | | Comments |
|---------------------|----------------|--------------|--|-------------------|------------|-------------|-----------------------|-----------------------------|
| Elevation (ft amsl) | Depth (ft bgs) | Soil Profile | Description | | % Recovery | Blow Count | Soil Column PID (ppm) | |
| 13.0 | 70 | | Grey-green silty sand. Wet, dense. | SM | | | No Data | Glaucconitic. |
| | 71 | | Grey-green silty sand. Wet, very dense. | | 100 | 41-100-0-0 | | |
| 11.0 | 72 | | Drill through. Interval not sampled. | | | | | |
| | 73 | | | | | | | |
| | 74 | | | | | | | |
| 8.0 | 75 | | Black-green silty sand. Moist, very dense. | SM | | | | Fossiliferous, glauconitic. |
| | 76 | | | | 80 | 38-41-47-53 | | |
| 6.0 | 77 | | Grey-green silty sand. Wet, very dense. | | | | | Fossiliferous, glauconitic. |
| | 78 | | | | | 44-36-20-31 | | |
| 4.0 | 79 | | End of Borehole | | | | | |
| | 80 | | | | | | | |
| | 81 | | | | | | | |
| | 82 | | | | | | | |
| | 83 | | | | | | | |
| | 84 | | | | | | | |
| | 85 | | | | | | | |
| | 86 | | | | | | | |
| | 87 | | | | | | | |

WELL DESIGN CONSTRUCTION:

Outer Casing Diameter / Type: 8" Steel

Inner Casing Diameter / Type: 4" PVC

Screen / Slot Size: PVC 10 slot

Casing Grout Type: Cement/Bentonite

Seal Type: Bentonite

Sand Pack Type 1: Morie # 00

Sand Pack Type 2: Morie # 0

IC-Interval: bgs

SC-Interval: 58.0' - 68.0' bgs

GT-Interval: 0.0' - 52.0' bgs

ST-Interval: 52.0 - 54.0' bgs

SP1-Interval: 54.0' - 56.0' bgs

SP2-Interval: 56.0' - 69.0' bgs

Outer Casing Elevation (amsl): 83.03

Inner Casing Elevation (amsl): 83.03

Ground Elevation (amsl): NA

Elevation Datum: NAVD 1988

WELL DEVELOPMENT:

Date: 12/28/98

Initial Depth to Water: NA

Pumping Rate: 10 gpm

Method: Overpumping

Final Water Turbidity: NA

Purged Volume: 450 gal